NETWORK WORLD

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Novell offers hybrid of NetWare 286

By Caryn Gillooly
Senior Editor

PROVO, Utah — Novell, Inc. last week unveiled a new version of its NetWare network operating system that combines the functionality of the company's four existing NetWare 286 versions into a single package.

NetWare Version 2.2 is much easier to install — a change for which users have clamored — and may eliminate confusion customers have had about which NetWare version to use for small businesses or departmental work groups.

As expected, Novell folded the ease-of-use characteristics of NetWare ELS I and II, as well as the advanced services and features found in Advanced NetWare and SFT NetWare, into NetWare Version 2.2 (Page 2 briefs, *NW*, March 18).

Novell also mixed in a few enhancements to extend the life of the 80286-based version of the network operating system for current Advanced NetWare and SFT NetWare users that do not plan to upgrade to NetWare 386.

In addition, Novell reworked NetWare pricing, charging for the software on the basis of the number of users supported, rather

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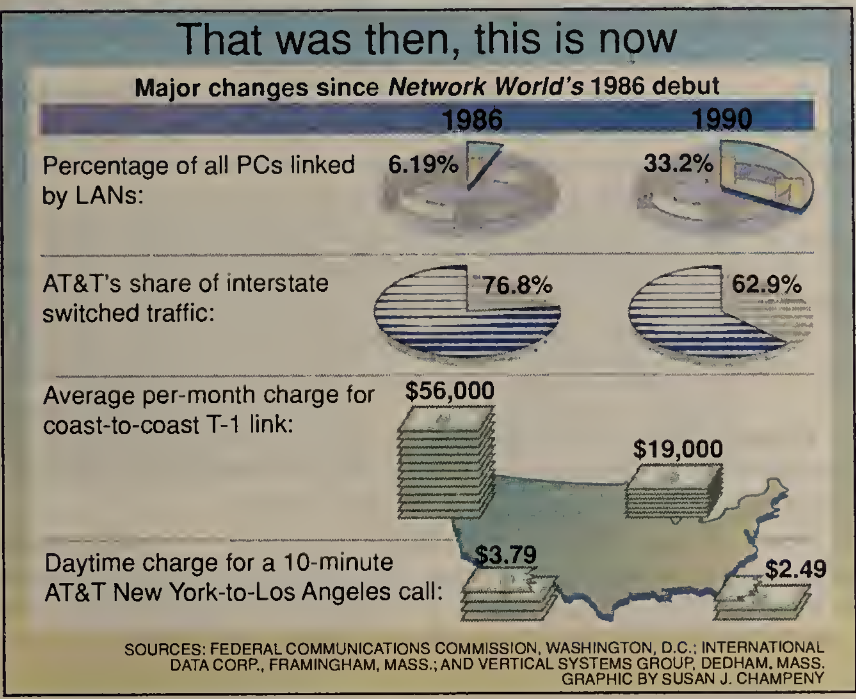

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GRAPHIC BY SUSAN J. CHAMPENY

Through the past briefly: 5 years of Network World

NW's 5th Anniversary

Five years ago this week, the first issue of *Network World* hit the desks of network executives across the U.S.

Since that inaugural issue, the industry has witnessed major changes in technology, as well as dramatic growth in the strategic importance of networking and the professional stature of the executives who design, build and operate enterprise nets.

This five-year anniversary issue offers a chance to examine the technologies and issues that have shaped the network community since the mid-1980s.

A series of articles beginning on page 49 explores some of the controversies, predictions — on and off the mark — and technology trends we've covered. It also offers a retrospective look at some of the major network projects that made the news in 1986.

These articles also offer readers a glimpse of the "hot news" during our first year and some of the lowlights during the last five.

MCI plans trials of long-distance SMDS

Plots interexchange tests of emerging high-speed switched data service with Nynex, Bell Atlantic.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — MCI Communications Corp. hopes to launch later this year long-distance trials of Switched Multimegabit Data Services (SMDS), *Network World* has learned.

The company, which is said to be negotiating with Nynex Corp. and Bell Atlantic Corp. for local connections, could be the first long-haul carrier to trial the high-speed switched digital service.

Although AT&T is participating in a multivendor trial of broadband transmission technologies, the SMDS portion of that trial will not be conducted on an interexchange basis until 1992 (see "Firms unite to form plan for broadband offerings," page 2). US Sprint Communications Co. has not committed to SMDS tests.

SMDS is a switched high-speed digital data service capable of supporting transmission speeds between 1.54M and 155M bit/sec. The service promises to be more cost-effective for certain applications, such as local-area network interconnection, than dedicated links.

Cooperation between local and long-distance carriers on SMDS is vital to users hoping to employ the service on a nationwide basis.

Larry Bouman, senior vice-president of program management and systems planning at MCI, confirmed that the carrier has discussed the possibility of trials with Nynex. He could not,

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FEATURE

DATACOM BUYER'S GUIDE

Universal mailbox is E-mail goal

By Mark Langner
Special to Network World

When on-line, computer-to-computer electronic messaging was first promoted as a viable commercial product in the early 1980s, it involved little more than the transmission of simple text messages between user mailboxes on host computers.

Electronic messaging has grown up a lot since then, especially during the past five years. E-mail providers now offer much more powerful messaging services, including file transfer, facsimile, electronic data interchange capabilities and support for voice messaging.

The major reason for the proliferation of these services has been an increase in competition. In 1980, when US Sprint Communications Co. introduced its original Telemail service, basic E-mail

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NETLINE

SUN-PARTNER SOFTWARE eases integration of Sun workstations and Macs. Page 4.

RBHCS PLAN ROLLOUT of SMDS services within the next 12 to 18 months. Page 4.

USERS ARE FRUSTRATED by delays in delivery of US Sprint's Global VPN service. Page 4.

FCC CHAIRMAN URGES the RBHCs to move more quickly in deploying new network technologies. Page 4.

N.Y. MERC PLOTS PLAN for electronic network supporting around-the-clock futures trading. Page 6.

US SPRINT PLANS MAJOR expansion of its international private-line offerings, plus new volume discount plan. Page 23.

NEWSPAPER

AT&T service for resellers may be boon for SDN users

By Jim Brown
Senior Editor

BASKING RIDGE, N.J. — AT&T last week filed a tariff for a service designed to lure long-distance service resellers away from its Software-Defined Network (SDN) service, a move that could free up SDN resources for end users and lead to faster service provisioning.

Called Distributed Network Service (DNS), the new service offers resellers as much as 43% off AT&T's basic domestic long-distance rates and as much as 15% off international Pro WATS rates.

Resellers gravitated toward SDN to support their residential and business customers because SDN offers larger discounts and greater profits compared with the WATS services they previously resold.

In 1988, the introduction of SDN switched access lured a slew of resellers into the market, an influx that overtaxed the infrastructure AT&T built to support the virtual network service. This forced AT&T to — among other things — try to discourage reseller use of SDN by imposing restrictions on how fast SDN networks could grow.

Migrating resellers to DNS could ease those restrictions for actual end users and result in faster service provisioning.

"This could help take the pres-

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Firms empower business managers to fill CIO role

Inability to pair company business goals with network services is holding IS managers back.

By Wayne Eckerson
Senior Editor

Hoping to more effectively wed technology and business strategy, some companies are naming nontechnical executives to the post of chief information officer (CIO).

While the ideal CIO would have strong management, business and technology skills, it is often difficult to find all those qualities in a single executive. As a result, some companies are handing the CIO job to managers with more business than technology savvy because of concern about the perceived inability of information systems (IS) managers to translate computing and network assets into a corporate advantage.

Others have opted for a two-tiered hierarchy in which the business-oriented CIO is supported by an experienced IS manager.

But there is a downside to appointing a nontechnical executive to head IS/network operations, observers say. Without a strong grasp of technology, CIOs may find it hard to maintain good rapport with IS professionals and could be snowed into making bad decisions by vendors or staffers.

The appointment of nontechnical managers to the CIO spot is seen by many as a failure of IS professionals to communicate in

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Kodak ports two strategic applications to run on LAN

Downsizing effort eases access, saves money.

By Caryn Gillooly
Senior Editor

ROCHESTER, N.Y. — Eastman Kodak Co. last week said it has downsized two strategic business applications to run on an OS/2-based local-area network, enabling customers to submit orders via electronic data interchange and access data on any of the company's 80,000 products and parts.

The downsizing effort was mandated by upper management to migrate applications from expensive mainframe hosts to less costly departmental LANs. It has simplified access to product information, improved remote terminal response time by about 20% and provided Eastman Kodak with a competitive edge — all while cutting the overall budget.

"The company is moving to multiple business units, so data processing is moving to platforms it can afford to maintain," said Gus Holderer, manager of EDI planning and development for Eastman Kodak's Distribution Division.

Microsoft enhances SQL Server to ease LAN application development, page 48.

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Firms unite to form plan for broadband offerings

By Anita Taff
Washington Bureau Chief

HOUSTON — Vowing to avoid interoperability problems and other obstacles that have hampered the acceptance of ISDN, three switch vendors and a local carrier have teamed up to devise deployment plans for broadband digital services.

In a press conference here at the Supercomm '91 conference, the AT&T Network Systems Group, Fujitsu Network Switching of America, Inc., Siemens Stromberg-Carlson and US West, Inc. said they will conduct a three-year trial focusing on the use of high-bandwidth technologies such as Switched Multimegabit Data Service (SMDS), switched T-1 and the Asynchronous Transfer Mode to support five business applications.

The project, which will be coordinated by Bell Communications Research, is dubbed Communications Programs for Advanced Switched Services (COMPASS).

The four firms said one of the most important aspects of the COMPASS project is its multivendor participation. The vendors will work together through COMPASS trials to avoid the interoperability problems that have

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Briefs

Nynex to tariff frame relay. Nynex Corp. last week said it will tariff a frame relay service for use by customers in its five-state region by year end, which would make it the first regional Bell holding company to offer frame relay service. Nynex will upgrade its Northern Telecom, Inc. DMS-SuperNode switches to support the service, according to Rashmi Doshi, technical staff supervisor with Nynex Corp.'s advanced technology development group.

Frame relay service, which operates at speeds ranging from 56K to 1.544M bit/sec, is best used by midsize users with sporadic data needs, Doshi said. "Our preliminary market research shows that quite a few midsize companies are interested in frame relay. We see it as a service that can handle these customer data needs for the next two years."

Nynex has yet to establish a pricing structure for the service.

Court OKs EC reforms. The European Community's Court of Justice last week issued a decision validating a major portion of the European Commission's program to end monopolies in European telecommunications markets. The ruling concerned a protest to a commission directive ordering countries to end carrier monopolies on the supply of communications equipment to users. Belgium, France, Germany, Greece and Italy had objected to the directive, arguing that the commission overstepped its authority. But the Court of Justice said the commission had the power to enforce it.

Bell Atlantic brings cellular inside. Bell Atlantic Corp.'s Mobile Systems unit last week said it plans to test cell sites in public buildings so customers can use their cellular phones indoors. The first microcell will be installed later this year in Washington, D.C.'s Union Station.

AT&T forges Spanish link. AT&T last week announced several agreements with Spain's government-owned monopoly carrier, Compania Telefonica Nacional de Espana, to provision new services and build a new submarine fiber-optic cable between the U.S. and Spain. The cable, which is expected to go live in 1994, will connect the Caribbean, Italy, Mexico, Spain and the U.S., and will support more than 15,000 64K bit/sec circuits. It will be the second fiber cable linking the U.S. to Spain, following the Trans-Atlantic Telecommunications-9 cable, which is expected to commence service this fall. AT&T also said it plans to introduce switched 56K and 64K bit/sec service, dubbed Switched Digital International, to Spain later this year, as well as its international virtual network service, Global Software-Defined Network.

BT to form global vendor team. A British Telecommunications PLC spokesman last week said the carrier will team with several international partners "to meet the global outsourcing needs of multinational users." No further details were available. Also last week, British Telecom announced the culmination of a yearlong image makeover centered around better serving customers worldwide. The corporate face-lift includes a new corporate logo and the merger of its BT Tymnet, Inc. and British Telecom, Inc. subsidiaries into a single business unit called BT North America, Inc.

MCI purchase of OTI finalized. MCI Communications Corp. last week completed its acquisition of Overseas Telecommunications, Inc. (OTI), a provider of international digital private-line services. Terms of the agreement, originally announced Sept. 18, were not disclosed, but analysts estimated that MCI paid about $38 million for the privately held carrier based in Alexandria, Va. OTI provides global voice, data and video communications services via satellite and fiber-optic facilities to 27 countries.

Court tells FCC to rethink license. A Washington, D.C. federal appeals court last week ordered the Federal Communications Commission to reconsider the 1989 license it awarded to American Mobile Satellite Corp. (AMSC) to provide a nationwide mobile voice and data communications service. The court faulted the FCC for not holding hearings to choose the best satellite-based mobile communications plan from among rival proposals and rejected the FCC's argument that such hearings would have been costly and time-consuming. AMSC, which is a consortium of eight companies, said it will forge ahead with its plan to provide mobile data service at up to 600 bit/sec in midsummer.

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LEGENT

Peer link ties Macs, Suns; translates protocols, data

IPT's Sun-Partner makes each a client and server.

By Eric Smalley
Senior Editor

CALABASAS, Calif. — With Sun Microsystems, Inc. marketing its Unix-based workstations more successfully to business users, integrating the workstations with Apple Computer, Inc. Macintoshes has posed no small challenge for network managers.

However, Information Presentation Technologies, Inc. (IPT) last week unveiled software that promises to ease that task by implementing a transparent link between Sun workstations and Macintoshes, enabling each to be both a client and a server to the other.

Sun-Partner, which resides on Sun workstations, creates a peer-to-peer connection between Macintosh computers and SPARCstation workstations, allowing the systems to share files and applications. That link is transparent, enabling each system to retain its native user interface, according to IPT President Jon Simonds.

The software translates networking protocols and operating system commands among the user interfaces on SPARCstations and Macintosh computers. Sun-Partner also translates the icon bit maps between the graphical user interfaces, Simonds said.

With Sun-Partner, Macintosh users see directories on the Sun workstation as a Macintosh Apple Filing Protocol (AFP) disk volume, and a Macintosh disk volume appears to the Sun user as a Network File System (NFS) directory, according to Simonds.

Sun-Partner supports data sharing for four types of applications, according to IPT officials. Data can be shared when the same application is running on both the SPARCstation and the Macintosh. Data can be shared between two different applications when they support standard file formats or when they include file format translators.

Also, data can be shared when an application is split between the two platforms, such as with a client/server application or when creating an image on a Macintosh and rendering it on a Sun workstation, according to the company.

In addition to data sharing, Sun-Partner allows network resources, such as data base servers, to be available simultaneously to both platforms. This includes Sun's Newsprint, which provides PostScript printing on non-PostScript printers.

Along with the software comes IPT's Easy System Administration, which allows Sun workstations and Macintosh computers on a Sun-Partner network to be managed from a Macintosh.

Sun-Partner works with Apple's AppleTalk Phase I and II over LocalTalk or Ethernet local-area networks. It also supports the Apple Data Stream Protocol and AFP. In the Sun environment, the software works with Transmission Control Protocol/Internet Protocol, Address Resolution Protocol, Reverse Address Resolution Protocol and NFS.

Until System 7.0 — the next release of the Macintosh operating system — is available from Apple, Sun-Partner will require Macintoshes to run IPT's Personal Server Network (PSN), which lets the Macintosh function as a server.

Sun-Partner is scheduled to be available in the second quarter. It costs $695 per SPARCstation. IPT's PSN software costs $295.

GVPN delays casting a pall on US Sprint's credibility

By Barton Crockett
Senior Editor

RESTON, Va. — Delays in the deployment of US Sprint Communications Co.'s Global Virtual Private Network (GVPN) service are frustrating some users and raising the specter of defections to other carriers' offerings.

GVPN will enable users to set up virtual networks spanning multiple countries and carriers. But US Sprint now says it won't begin rolling out GVPN service until May, eight months later than the September 1990 availability announced at the service's unveiling in April 1990.

Additionally, some highly touted GVPN features, such as the ability to receive a single invoice for GVPN services supported by carriers around the world, will not be available before the second quarter of next year, according to US Sprint officials.

The delays began in 1989 with the predecessor to GVPN, US Sprint's International Virtual Private Network (IVPN).

IVPN enables users to establish customized, seven-digit dialing plans for calls between sites in the U.S. and one other country. Traffic is carried over voice-grade circuits. GVPN will support seven-digit dialing between multiple countries, as well as switched 56K and 64K bit/sec data services.

When US Sprint introduced IVPN at the International Communications Association's 42nd Annual Conference and Exposition in April 1989, it said the service would be generally available a year later between the U.S. and Mercury Communications, Ltd.'s network in the U.K.

Instead, IVPN did not debut to the U.K. until September 1990, after the introduction of service in June between the U.S. and Unitel Communications Corp. in Canada. Limited service to Hong Kong began in October. According to US Sprint, fewer than 10 customers now use the service.

In April 1990, US Sprint announced GVPN, with a scheduled cutover of September. But US Sprint now plans to roll out GVPN to the U.K. and Hong Kong in May, and to Canada, the Netherlands and possibly Japan by the fourth quarter.

In the meantime, AT&T has expanded its Global Software-Defined Network (SDN) into Australia and the U.K., and plans to begin taking orders by next week for service to Canada with Unitel, to France with France Telecom, and to Japan with Kokusai Denshin Denwa, Ltd. MCI Communications Corp. has also begun international Vnet service to London.

"It's important that vendors make the dates they promise just to maintain credibility," said Larry Ehlers, manager of telecommunications at the Bendix/King General Aviation Avionics division of Allied Signal Corp.

Bendix/King had been planning to use GVPN to support videoconferences to a company site in Singapore until funding was pulled from the project.

"They're losing their window [of opportunity]," said Daniel Briere, president of TeleChoice, Inc., a network consultancy in Montclair, N.J. "Sprint was ahead and could have cleaned up. But AT&T is going whole hog, and Sprint may lose their advantage."

Andrew Burroughs, US Sprint's vice-president of global marketing, attributed the delays to the complexity of the service and problems convincing Northern Telecom, Inc. to devote enough resources to GVPN.

GVPN and IVPN are being offered via Northern Telecom switches and require a common implementation of switch software in multiple countries.

But Burroughs insisted that US Sprint is not losing customers. He said US Sprint's IVPN equals or exceeds the other carriers' offerings and GVPN will surpass them by providing digital transmission and multicountry networking.

Bill Evans, AT&T's Global SDN marketing manager, countered that Global SDN will provide capabilities similar to GVPN.

Several RBHCs announce progress on SMDS devices

By Bob Wallace
Senior Editor

HOUSTON — Several regional Bell holding companies detailed plans at the Supercomm '91 conference here last week to offer Switched Multimegabit Data Service (SMDS) within the next 12 to 18 months.

SMDS is a Bell Communications Research standard for switched digital services ranging in speed from 1.544M to 155M bit/sec. SMDS is designed to offer large users a less expensive alternative to leased lines for high-bandwidth applications such as local-area network interconnection, videoconferencing and bulk file transfer.

Nynex Corp., BellSouth Corp. and Southwestern Bell Corp. are among the RBHCs that are conducting internal SMDS trials to be followed soon after by customer field trials and tariffed SMDS services (see "Apple praises SMDS results in PacBell test," page 17).

Users at the conference expressed interest in SMDS and other high-speed data services. "We are taking a long look at SMDS and frame relay technology," said Phillip Evans, International Communications Association (ICA) president and telecommunications director at FMC Corp. in Dallas. "We think both may play a future role in our corporate network."

Nynex will target SMDS at large users with high-bandwidth applications such as LAN interconnection and point-to-multipoint electronic document distribution, said Rashmi Doshi, technical staff supervisor with Nynex's advanced technology development group.

"We believe frame relay will satisfy some LAN interconnection so we may be able to focus SMDS largely on users with applications that require much higher levels of bandwidth. Over the next three to four years, we expect LAN interconnection [at 45M bit/sec] to become quite common."

Nynex is currently conducting internal SMDS trials using an AT&T Network Systems Group Broadband Networking Switch (BNS)-2000 SMDS switch and hopes to begin evaluating Fujitsu America, Inc.'s FETEX-150 switch early next year.

"If all proceeds as planned, we will tariff SMDS by mid-1992," Doshi said.

BellSouth recently kicked off an internal SMDS trial in which it interconnected LANs at its Atlanta and Birmingham, Ala., sites using a prototype model of the BNS-

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Sikes urges RBHCs to invest in developing domestic nets

Presents message at Supercomm '91 conference.

By Anita Taff
Washington Bureau Chief

HOUSTON — FCC Chairman Alfred Sikes last week said the regional Bell holding companies are investing too slowly in new network technologies and challenged them to adopt a more entrepreneurial approach to meeting user needs.

In a keynote address at the Supercomm '91 conference here, Sikes cautioned the RBHCs about diverting funds abroad that could be allocated to domestic network projects. He also warned the carriers that failure to modernize their networks leaves them vulnerable to emerging competitors.

Sikes said that while some carriers — particularly Bell Atlantic Corp. and BellSouth Corp. — have moved aggressively in deploying new technologies such as Signaling System 7 (SS7), there are wide disparities in the level of carriers' network investments.

In a press briefing after his speech, Sikes said independent telephone companies have deployed about twice as many digital access lines as the RBHCs. Additionally, figures compiled by the Federal Communications Commission show that SS7 deployment varies substantially between carriers and even within carrier regions.

Sikes' speech echoed many of the themes he raised in one of his first appearances after becoming FCC chairman. Appearing at the 1989 fall meeting of the U.S. Telephone Association in San Francisco, Sikes said the RBHCs

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Correction: The Buyer's Guide "A guide to wiring hubs: smart, smarter, smartest" (*NW*, Mar. 11) had an incorrect paragraph about terminal servers. It is Hughes LAN Systems, not Banyan Systems, Inc., that has introduced a line of terminal servers that plug directly into the intelligent hubs of Cabletron Systems, Inc., Chipcom Corp. and SynOptics Communications, Inc.

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HEWLETT PACKARD

N.Y. Mercantile to construct after-hours futures net

Electronic network puts weight behind proposal for around-the-clock trading in stock and futures.

By Barton Crockett
Senior Editor

NEW YORK — The New York Mercantile Exchange last week said it has struck agreements with two vendors to build an electronic network that will support futures trading after regular exchange hours.

The network project adds momentum to the push by stock and futures exchanges worldwide to support around-the-clock trading in financial instruments.

"We open at 9:45 a.m. and close at 3:15 p.m.," said Z. Lou Guttman, chairman of the New York Mercantile. "There are another 18 hours of trading we'd like to support."

The network, which is scheduled to go live in about 10 months, will support trading in energy, platinum and palladium futures contracts. AT&T and Task Management, Inc. of Chicago will build and operate the electronic trading network.

Howard Zatkowsky, an area manager for AT&T Computer Systems here, said the electronic trading system will be supported by Task Management trading software running on Tandem Computers, Inc. fault-tolerant computers at the exchange's premises here.

DDS access

Zatkowsky said futures traders' workstations will access the Tandem systems over 9.6K bit/sec AT&T Dataphone Digital Service circuits running into AT&T Paradyne multiplexer nodes at the New York Mercantile Exchange and at sites in Chicago and Houston. The nodes will be connected using T-1 and 56K bit/sec lines.

AT&T will maintain a backup data center with a Tandem processor owned by the New York Mercantile Exchange in a New Jersey site, Zatkowsky said. That site will be brought on-line if the exchange is hit by a power outage, network outage or other disaster. The network will link about 170 locations.

According to Guttman, the network will be the primary tool used by New York Mercantile Exchange members in the U.S. to trade after regular operating hours.

In the future, he said, the exchange might use the Globex electronic trading network being developed by the Chicago Mercantile Exchange to support international, after-hours trading. Guttman said the New York Mercantile Exchange would not be able to access Globex until next year or the year after.

Other exchanges that are considering cutting over electronic trading networks include the New York Stock Exchange and the Chicago Board of Trade, which plans to merge its Aurora trading network with Globex.

Guttman said the New York Mercantile would consider letting other exchanges use its network to support after-hours trading.

MCI plans long-haul SMDS trials

continued from page 1

however, confirm that MCI has met with Bell Atlantic, although a Bell Atlantic spokesman said the companies have discussed the project.

Bouman said no decision has been made on whether to offer a commercial SMDS service.

"[SMDS trials] are part of an overall process of continually searching the horizon for technologies that make our network operate more efficiently or allow us to offer new services to our customers," he said.

> According to Stanley Ooi, project manager at Hewlett-Packard Laboratories, "Interexchange carrier involvement is very important. Effective collaboration [between carriers and equipment vendors] is critical to SMDS."
>
> ▲▲▲

The trial under discussion with Nynex could be part of a fiber-optic network test project known as Aurora Net, which will include SMDS as well as other broadband technologies.

Bouman said Bell Atlantic, MCI and Nynex have discussed participating in the project, which is being organized by the Corporation for National Research Initiatives in Reston, Va.

The research net would extend from Boston to Philadelphia.

A spokesman at Bell Atlantic confirmed that the carrier is talking to MCI about an SMDS trial but did not specify whether it would involve the Aurora Net project. He said no agreement has been reached.

Bell Atlantic is scheduled to complete an SMDS trial with Temple University in Philadelphia at the end of March and is planning to offer SDMS on an intra-local access and transport area basis in as many as six LATAs by year end. The local carrier is also evaluating opportunities to team up with long-distance carriers to offer SMDS on an inter-LATA basis.

Because SMDS is a public switched network service, carriers and vendors are hopeful that it will provide broadband capabilities more economically and on a more dynamic basis than current private-line services.

But long-distance carrier involvement is vital to the success of SMDS, according to numerous speakers at the Supercomm '91 conference here last week. Typical applications for SMDS include high-resolution medical imaging, LAN-to-LAN links and supercomputer networking. Speakers said SMDS must be available on a nationwide basis in order to be valuable to users.

"[SMDS] is not going to be valuable if it's not national and international," said Al Pereira, staff manager of technology implications at GTE Corp.

Stanley Ooi, project manager at Hewlett-Packard Laboratories, agreed. "Interexchange carrier involvement is very important," he said. "Effective collaboration [between carriers and equipment vendors] is critical to SMDS."

Actions under way

The Broadband Projects Services Team, sponsored by Bell Communications Research to oversee implementation of SMDS on a nationwide basis, has been meeting with long-distance carriers for the past six months to discuss their involvement in the service, according to Bill Jerome, chairman of the Broadband Team and manager of new product development at Ameritech.

According to MCI, Bellcore last December issued its first draft of the Inter Carrier Interface, which specifies how SMDS traffic is handed off between local and long-distance carriers. Switching SMDS traffic between carriers and establishing billing procedures are two of the areas that carriers must address in their trials, according to speakers at Supercomm.

RBHCs announce SMDS progress

continued from page 4

2000 SMDS switch. The goal of the test was to identify applications that can use SMDS.

BellSouth uses SMDS to download images from one site to another and to give users on one LAN access to a large data base at the other sites.

Before the trial, BellSouth used two dedicated 56K bit/sec lines between the sites to support these applications. "Sending 10M- to 20M-byte files from one site to another took hours and, therefore, could not be done until late at night when the lines weren't in use," said Christian Noll, a product marketing manager with BellSouth Services, Inc.

Rollout plans

BellSouth plans to launch an SMDS market trial with a few select users in the first quarter of 1992. "We'll be looking to verify internal methods and procedures for ordering and provisioning service, and making sure there is a market for SMDS at the prices we set," Noll said.

If all proceeds on schedule, BellSouth will tariff SMDS in a handful of major metropolitan areas by year end.

"We'd like to tariff SMDS earlier, but we don't want to tariff a service that's based on a prototype product," said Noll, referring to the AT&T BNS-2000 switch, which is not expected to be commercially available until mid-1992.

According to preliminary BellSouth market research, roughly 90% of the SMDS market over the next three to five years will be for switched 1.5M bit/sec service, Noll said. The company has not yet decided how it might structure SMDS pricing. "We're going to price SMDS to what users want, instead of setting price in a vacuum and later trying to cram it down users' throats," he added.

It is likely that BellSouth will offer a menu of SMDS pricing options. Users could pay a usage-based price, a flat-rate price or a combination of the two, in which they would pay one rate and then extra fees for any usage over a predetermined level, Noll said.

"We want to price SMDS so it becomes an affordable tool for network managers to consider when designing data networks," he said.

Southwestern Bell Corp. began an SMDS technical trial in October 1990 between two sites in St. Louis.

"The purpose of the trial was to gain an understanding of how SMDS works. We want to learn how to operate, administer and measure SMDS performance," said Steve Crider, customer application analysis area manager for Southwestern Bell Telephone Co.

Southwestern Bell's next step is to begin an internal SMDS trial in which it replaces dedicated links between sites with SMDS switched links supported by an AT&T BNS-2000 switch in the second quarter of this year.

Sikes urges RBHCs to invest

continued from page 4

needed to move faster in rolling out new services.

The RBHCs complain that current regulatory structures such as the Modified Final Judgment business restrictions, lengthy depreciation schedules and rate-of-return rules act as disincentives to network investments. In some states, for example, carriers are not allowed to recoup investments in advanced service technology from ratepayers. That means shareholders must bear the costs.

While Sikes is sympathetic to the RBHCs' complaints, he said the carriers must be willing to gamble with more than just ratepayer money.

"I think it would be a mistake for the Bell companies not to use shareholder money to push the edge of the envelope domestically," Sikes said.

The chairman vowed to help carriers clear away burdensome regulations, saying he would continue to press Congress to lift the Modified Final Judgment business restrictions on information services and manufacturing. Sikes said he would also support a limited easing of the interexchange prohibition so that the RBHCs could centralize processors and data bases for advanced services.

But he said the RBHCs cannot afford to wait for changes before investing in their networks.

"I understand the obstacles Bell companies confront, but I also know that farsightedness, enterprise, enthusiasm and persistency are always key to developing new markets," Sikes said.

Sikes is concerned that the RBHCs are increasingly pouring money into foreign ventures, rather than investing in the U.S. network.

"It is alarming to think that going head-to-head with satellite TV broadcasting in the U.K. — even with the prospect of becoming the third local exchange carrier [there] — is seen to be a better business than advancing information technologies in your own backyard," Sikes said.

The RBHCs must move more quickly to protect themselves from an array of competitors, including cable systems operators, cellular and radio services, and satellite, he added.

"Any company that fails to push forward and reach for state-of-the-art technology puts itself at risk," Sikes said.

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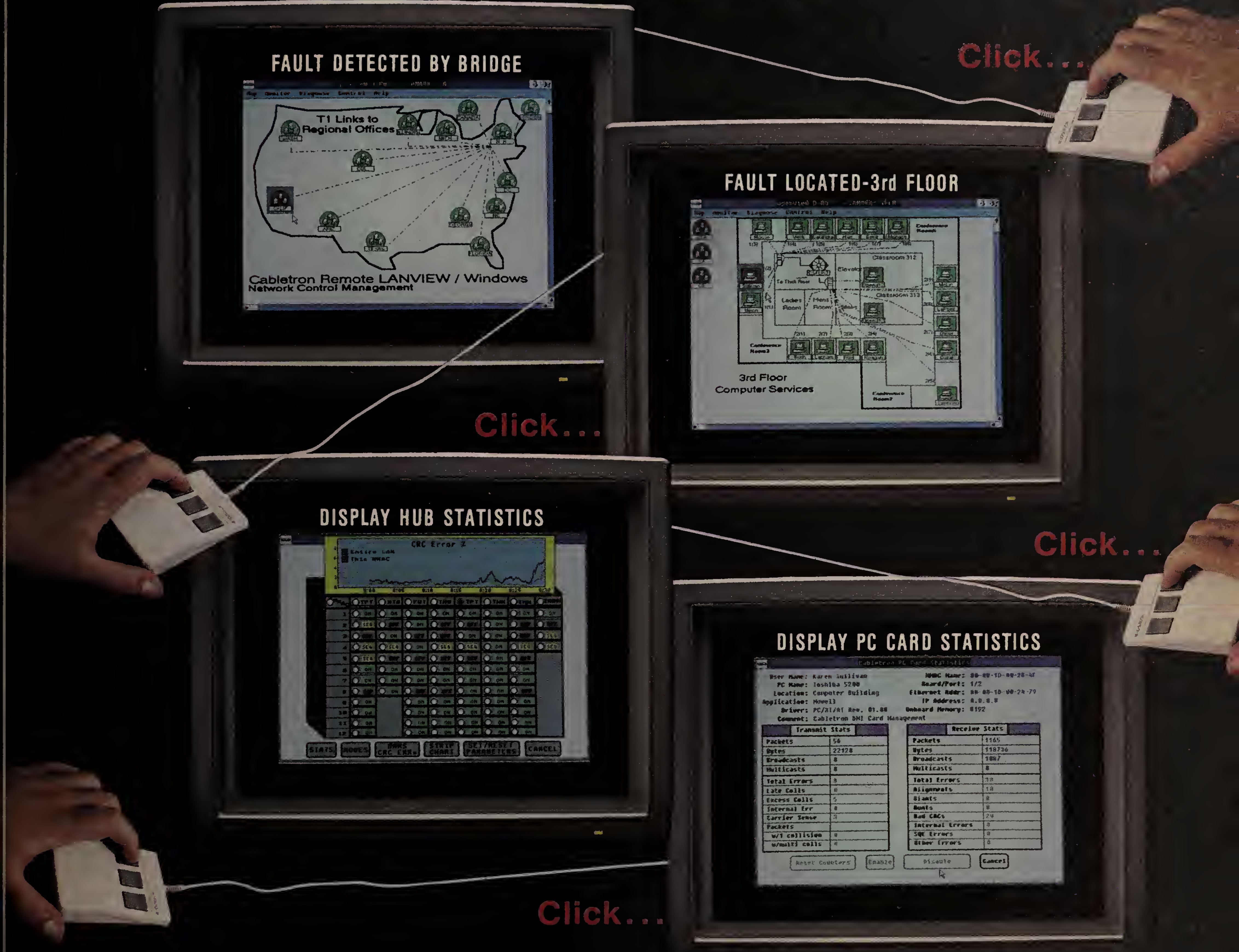

Cabletron PC Card Statistics

User Name: Karen Sullivan
PC Name: Toshiba 5200
Location: Computer Building
Application: Novell
Driver: PC/XT/AT Rev. 01.00
Comment: Cabletron DNI Card Management
MMAC Name: 00-00-1D-00-28-4F
Board/Port: 1/2
Ethernet Addr: 00-00-1D-00-24-79
IP Address: 0.0.0.0
Onboard Memory: 8192

Transmit Stats	
Packets	56
Bytes	22128
Broadcasts	0
Multicasts	0
Total Errors	8
Late Colls	0
Excess Colls	5
Internal Err	0
Carrier Sense	3
Packets	
w/1 collision	0
w/multi colls	0

Receive Stats	
Packets	1165
Bytes	118736
Broadcasts	1087
Multicasts	0
Total Errors	39
Alignments	10
Giants	0
Runts	0
Bad CRCs	29
Internal Errors	0
SQE Errors	0
Other Errors	0

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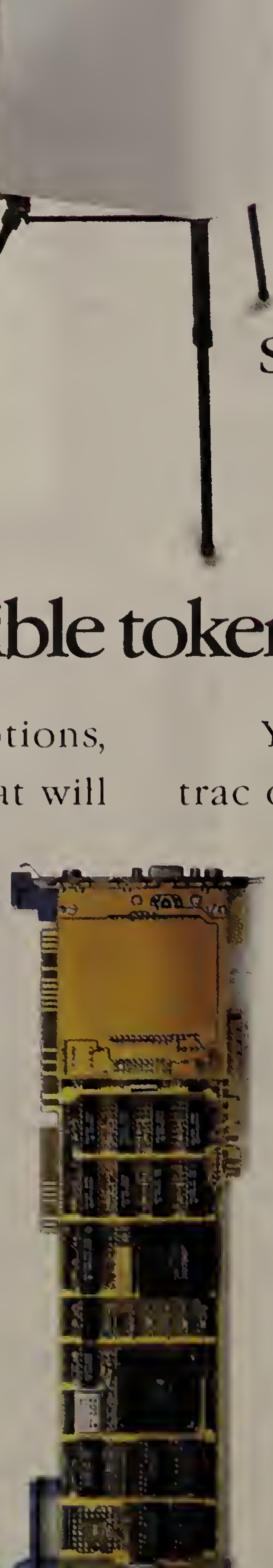

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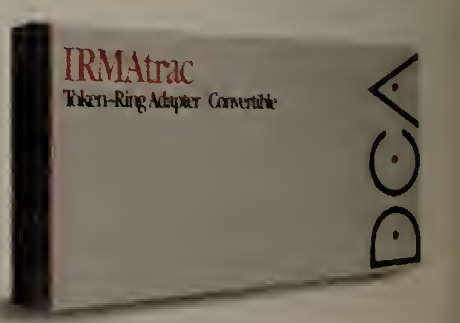

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TITLE ....

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DIVISION/DEPARTMENT ....

STREET ADDRESS ....

CITY .... STATE .... ZIP ....

C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government State/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other ____________________

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporate Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other ____________________

3 What is the scope of your involvement in purchase decisions for Network/Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwave
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5. ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER ____________

9 What is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07. ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09. ☐ NOVELL (NETWARE)
10. ☐ TOPS
11. ☐ PROTEON (PRONET)
12. ☐ OTHER ____________________

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ 10BASET
9. ☐ OTHER ________

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8. ☐ XENIX
9. ☐ PICK
0. ☐ OTHER ______

12 Please indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently installed in your network.

B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am presently involved in the purchase process for the following products/services:

B) I plan to purchase the following products/services in the next 12 months:

Presently Involved A	Plan to Purchase B	LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	COMPUTERS/PERIPHERALS:
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11 ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14. ☐	☐	Printers
15. ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers
Presently Involved A	Plan to Purchase B	SOFTWARE:
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Software
23. ☐	☐	Applications Software
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
28. ☐	☐	E-Mail Software
A	B	DATA COMMUNICATIONS:
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packet Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Test Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adapter Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Software
A	B	TELECOMMUNICATIONS:
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	SERVICES:
53. ☐	☐	Switched Voice
54. ☐	☐	Dedicated Leased Line
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packet Switched
59. ☐	☐	Centrex
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

(continued on next column)

17 Estimated value of networking equipment and services:

A: Which you helped specify, recommend or approve in the last 12 months?

B: Which you plan to help specify, recommend or approve in the next 12 months?

A	B
1 ☐	☐ $100 million and over
2 ☐	☐ $50 - $99.9 mill
3 ☐	☐ $25 - $49.9 mill
4 ☐	☐ $20 - $24.9 mill.
5 ☐	☐ $10 - $19.9 mill.
6 ☐	☐ $5 - $9.9 mill.
7 ☐	☐ $1 - $4.9 mill.
8 ☐	☐ $500,000 - $999,999
9 ☐	☐ Under $500,000

18 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bill.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rate Interface Terminal Adapters
2. ☐ Primary Rate Interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will you consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER ____________

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

Microsoft Corp.'s pending acquisition of Consumers Software, Inc. "is bad news for developers. Anytime you have an acquisition like this, the red tape grows and the acquired company becomes less responsive."

Tom Meredith
Vice-president of
sales and marketing
VoxLink Corp.
A Nashville voice mail
application developer

People & Positions

Bytex Corp., a Southborough, Mass., maker of matrix switches and local-area network products, recently named **Arthur Carr** as its president and chief executive officer. Carr was appointed in January as a consultant to Bytex's board of directors and as acting president and CEO following the resignation of **Jeffrey Goodman** as Bytex's president and CEO.

Carr previously served as president of Codex Corp., as well as president and CEO of Stellar Computer, Inc., a company he cofounded.

Newbridge Networks Corp., a Kanata, Ontario, maker of voice and data communications equipment, recently reorganized into three global regions — the Americas; Europe, the Middle East and Africa; and the Pacific Rim and Soviet Union.

Mike Pascoe was named general manager of the Americas unit. He will supervise Newbridge's activities in the U.S., Canada and Latin America. **Bob Broomfield** was named general manager for the Pacific Rim and Soviet Union. Previously, he was assistant vice-president of application engineering. **John Everard** will continue as general manager for Europe, the Middle East and Africa. ◻

NATA unit looks to bolster used equipment market

Alliance aims to increase vendor support services.

By Bob Brown
Senior Editor

DALLAS — A newly formed alliance of vendors and distributors will meet here this week to hammer out standards for service and support in the used telecommunications equipment market.

The formation of the Telecommunications Equipment Remarketing Council, which includes AT&T, Rolm Co. and about a dozen other vendors and distributors, was announced earlier this month. A body of the North American Telecommunications Association (NATA), the council was formed to explore ways of improving the used equipment market. This will help assure users they can obtain adequate support from manufacturers and third-party service firms.

One goal of the new council, according to a NATA spokeswoman, will be to encourage equipment manufacturers to get more involved in the secondary market. Many manufacturers view this area as an obstacle to new equipment sales, she said.

At its first meeting, the council plans to propose development of a program to certify service and support organizations capable of providing adequate services to buyers of used telecommunications equipment, said David Potter, the council's chairman. Potter is also chairman and chief executive officer of Source Telecommunications, Inc., a Dallas-based supplier of used telecommunications equipment.

Users, he said, are not satisfied with the technical and software support they receive with used equipment purchases, often because many equipment makers are reluctant to provide assistance due to conflicts of interest between used and new equipment sales. Users also need better support for products they already own but want to relocate.

"I hope we can come up with a system that makes available certified service and installation companies," Potter said. This would be a system dedicated "to extend the useful economic life of telecom equipment," he added.

Several users have been invited to next week's council meeting in order to help devise such a program, Potter said. ◻

INDUSTRY BRIEFS

Fujitsu unit reorganizes. Fujitsu Business Communication Systems in Anaheim, Calif., last week announced a major restructuring designed to improve customer service.

The private branch exchange maker is moving from being a centralized company to a decentralized firm organized into three U.S. regions — Eastern, Central and Western. Those regions will be broken down into business units in 11 strategic cities that will be responsible for sales, marketing, installation and service activities within their geographic areas, according to Tony Carollo, Fujitsu Business Communication Systems' chief operating officer.

The restructuring will involve 96 layoffs and the relocation of another 70 employees. Fujitsu Business Communication Systems, a subsidiary of Fujitsu America, Inc., employed a total of 1,175 people before the layoffs.

3Com reports big loss. 3Com Corp., a Santa Clara, Calif., maker of network equipment, last week reported a loss of $40.8 million for its third fiscal quarter, ended Feb. 28. That figure, affected by a onetime $67 million charge against earnings, compares to earnings of $6.7 million in the third quarter a year ago. The charge resulted from several actions, including 3Com's sale of its Maxess Systems Network Architecture product line to Attachmate Corp.

The company reported third-quarter revenue of $92.4 million, down from revenue of $107.3 million in the third quarter last year.

3Com recently moved away from its previous focus on client/server computing to focus on selling adapter boards, internetworking gear and other global data networking equipment. ◻

New Audio Messaging Interchange Specification (AMIS) subcommittees

1. Directory services subcommitee:
Exploring methods of providing a voice mail address directory, possibly via X.500.

2. Conformance testing subcommittee:
Looking to team up with a third-party testing center in order to validate vendor implementations of AMIS protocols.

3. Analog specification interpretation subcommittee:
Addressing questions and issues pertaining to the implementation of AMIS analog voice mail specifications.

4. Digital specification interpretation subcommittee:
Responding to questions and issues pertaining to the implementation of AMIS digital voice mail specifications.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: HATFIELD ASSOCIATES, INC., BOULDER, COLO.

Unisys latest to jump on AMIS bandwagon

Firm's Network Applications Platform now supports digital version of AMIS for voice interoperability.

By Bob Brown
Senior Editor

HOUSTON — Unisys Corp. last week became the latest vendor to announce support for the Audio Messaging Interchange Specification (AMIS) protocols in an effort to promote interoperability with other vendors' voice processing systems.

The AMIS protocols are specifications endorsed by a consortium of 39 voice mail system vendors and users to promote interoperability among voice mail systems. Unisys' support for AMIS is expected to be followed by similar announcements in the next year by voice mail system suppliers, according to vendors and analysts.

At the Supercomm '91 trade show here, Unisys said it enhanced its Network Applications Platform — a hub that can be used to interconnect multiple voice mail systems — to support a digital version of AMIS, which incorporates more stringent security features than an analog version.

Unisys said it will deliver AMIS support in the third quarter.

"Implementation of the specs by vendors could really help change the way users look at voice mail," said Gus Bender, second vice-president of telecommunications at The Travelers Corp. in Hartford, Conn., and an AMIS member.

Unlike Unisys, most vendors that have announced plans to support voice mail system interoperability this year plan to implement the AMIS analog specification.

This second set of AMIS specifications supports voice mail networking on a simple dial-up basis.

Active Voice Corp. of Seattle became the first vendor to support the AMIS analog specification last October when it released a version of its Repartee voice mail software incorporating the specification.

A number of other voice mail system vendors, including AT&T, Digital Sound Corp. and VMX, Inc., have announced plans to deliver products supporting the AMIS analog specifications this year.

David Ladd, chairman of the AMIS Steering Committee and executive vice-president at VMX, said users have even started asking about vendors' AMIS specification implementation plans in their requests for proposal.

Rule by committee

Having accomplished its mission of delivering the specifications and encouraging vendors to implement them, the AMIS project group recently formed several new committees to ensure the usefulness of the specifications.

One group will work with vendors to resolve questions on how to interpret or implement the analog specifications as they incorporate them into products. Another subcommittee will do the same for the AMIS digital specifications.

A third group is charged with finding a third-party firm to establish a conformance test center to assure AMIS conformance and interoperability among different vendors' products.

A fourth new AMIS committee is addressing the need for directory services. Directory services, which could be based on X.500, would be particularly important when linking the voice mail systems of two different companies that do not know each others' voice mail addresses, AMIS members said. ◻

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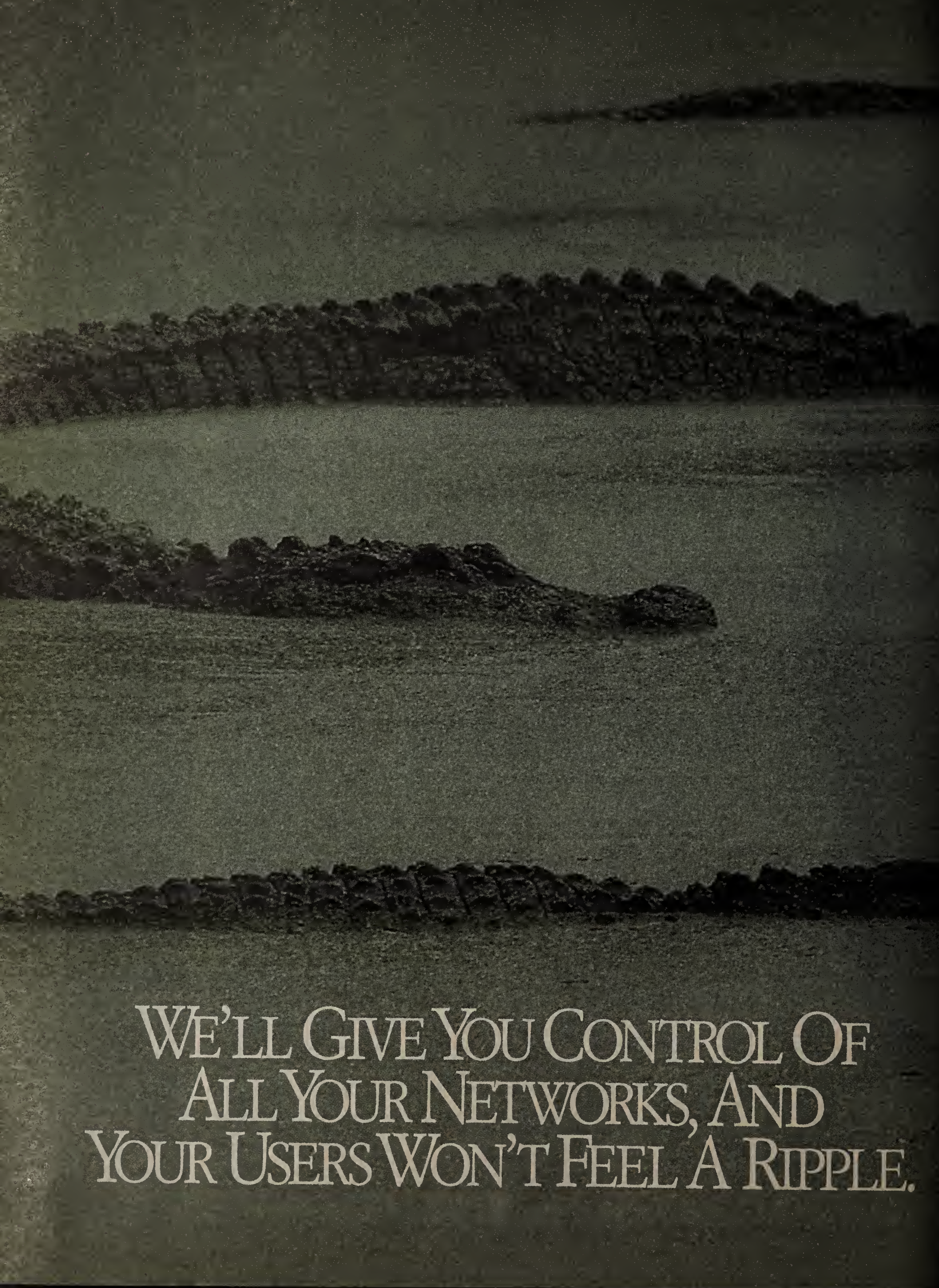

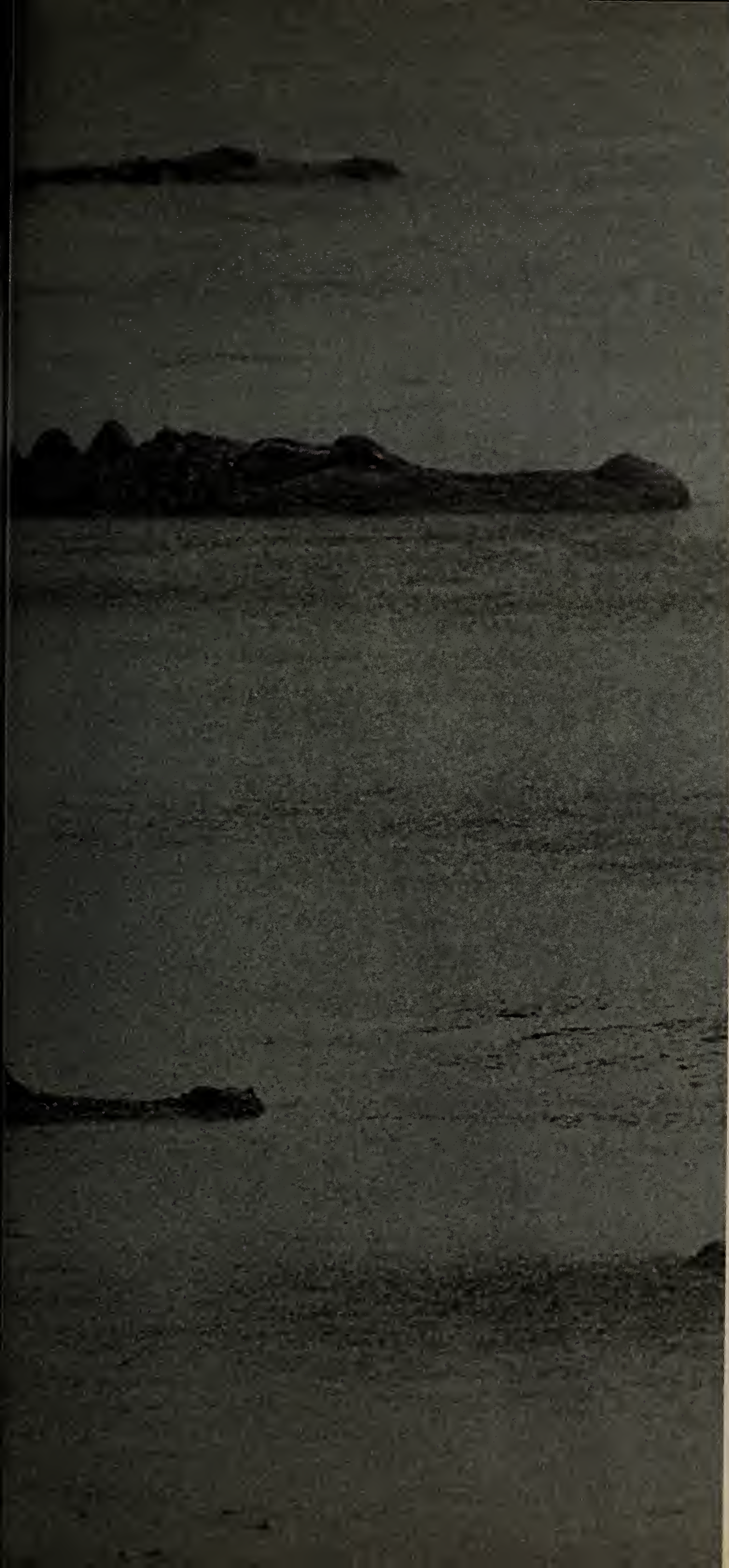

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TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

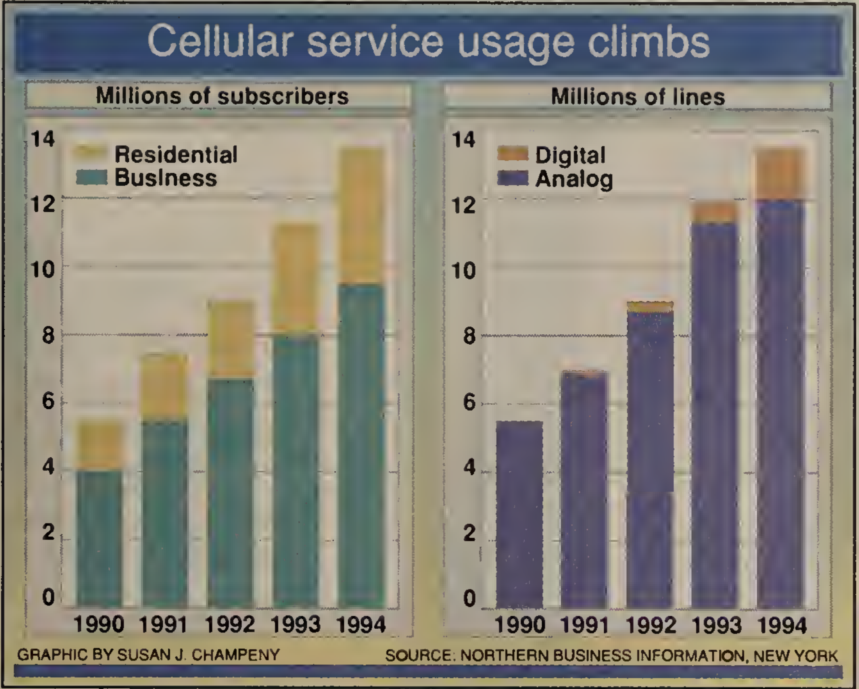
The percentage of customer access lines supported by digital switches in Nynex Corp.'s five-state region rose from 16% in 1986 to 24% in 1987 and to 38% in 1988. That percentage climbed to 49% in 1989 and to 56% last year.

Carrier Watch

Metropolitan Fiber Systems, Inc. (MFS) of Oakbrook Terrace, Ill., last week announced plans to spend $150 million to $160 million by year end to complete construction of its New York City fiber network and expand nets in three other cities. The number of buildings the alternative access and private-line service provider now serves is 30, a number that is expected to soar to 150 by year end.

MFS Chief Executive Officer Royce Holland said the company will begin construction of fiber networks in nine cities in 1992. The cities are Atlanta, Cleveland, Denver, Indianapolis, Kansas City, Mo., Miami, New Orleans, Seattle and Washington, D.C. MFS can provide service to users served by its networks two to 21 days after receipt of order, Holland said. About 80% of in-service MFS circuits carry voice traffic with data accounting for the balance.

Metropolitan Fiber Systems of New York, Inc. recently announced it will provide three New York-based brokerages with alternative local access and high-speed private-line services. The brokerages, Garband, Ltd., Garvin Guy Butler and Titus & Donnelly, are the bypass carrier's first New York customers. The firms will use MFS for fiber-optic local access services and to replace 64K bit/sec service from New York Telephone Co. and Teleport Communications Group. ◘



GRAPHIC BY SUSAN J. CHAMPENY SOURCE: NORTHERN BUSINESS INFORMATION, NEW YORK

FCC proposes adoption of rules to limit slamming

Hopes guidelines put an end to MCI-AT&T battle.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The Federal Communications Commission took steps last week to end a bitter feud between AT&T and MCI Communications Corp. in which each has accused the other of stealing customers.

The dispute erupted publicly last year when each of the carriers filed a lawsuit for financial damages, claiming the other was stealing customers by switching them without their consent or knowledge, a practice called slamming.

In December, the carriers reached an out-of-court settlement. They have refused to discuss the terms of the settlement other than to say they have agreed on a set of guidelines to follow when soliciting new customers.

Being switched to a new carrier without consent is particularly irksome because customers not only have to deal with the administrative hassle of switching back, but the local carriers typically charge a fee for implementing a carrier change.

At a recent public meeting of the FCC, the commission proposed adopting the set of guidelines drawn up by AT&T and MCI as formal rules for all carriers. The rules would require that carriers use at least one of three methods to verify that customers chose to switch to a different carrier.

The carriers would have to present an authorization form signed by the customer, provide an electronic means of verification such as an audiotex system or use a third party to verify verbally that users want to switch.

FCC Common Carrier Bureau Chief Richard Firestone said the agency received about 2,000 complaints from consumers last year saying they had been switched to a new long-distance carrier without their consent.

MCI led the pack with 1,047 complaints filed against it, followed by US Sprint Communications Co. with 478, National Telecommunications Network with 73 and AT&T with 64.

Firestone said one reason MCI may have had so many more complaints filed against it was that it was conducting a massive campaign to win new customers last year, placing seven million telemarketing calls. In comparison, AT&T said it had placed five million calls during the same period.

Firestone said some local carriers are considering implementing tariffs that impose high costs on long-distance carriers for returning illegally switched customers to their original carrier.

In addition to the proposed rules, the FCC is asking industry members to suggest alternative measures to protect consumers.

One such idea, proposed by the National Association of Regulatory Utility Commissioners (NARUC) but not included in the FCC's proposal, is a cooling-off period during which customers who agree to switch carriers would be provided with written information about the new service and be given an opportunity — either through a postcard or an 800 number — to change back.

In addition to verification methods, the FCC is seeking comment on the cost to carriers of implementing the new telemarketing safeguards. ◘

AT&T releases line of AIN telco devices

Products are among first to support standards published by Bell Communications Research.

By Bob Wallace
Senior Editor

MORRISTOWN, N.J. — AT&T Network Systems Group recently introduced four new products that telephone companies can use to develop customized calling services.

The products, collectively called A-I-Net Products, are among the first to meet the specifications spelled out in Bell Communications Research's emerging Advanced Information Network (AIN) standard.

The goal of AIN is to create standards that will enable telephone companies to use a variety of information processing and switching equipment to provide advanced services instead of having to buy into the proprietary offerings of their central office switch vendors.

Intelligent SCPs

Part of the AIN initiative calls for off-loading some network intelligence from central office switches and putting it into special adjunct processors, such as service control points (SCP). Three of the four products announced last week are software programs that can be used to configure Unix-based minicomputers as SCPs, Service Circuit Nodes (SCN) or Service Management Systems (SMS).

The fourth product, the Service Creation Environment (SCE), is a development tool designed to run on a Sun Microsystems, Inc. workstation.

Mats Samuelsson, intelligent network product and service manager for AT&T, said telephone companies will use A-I-Net products to develop advanced 800 services, virtual network offerings and "follow-me" call forwarding services.

"These services are just the tip of the iceberg," Samuelsson said. "Telephone companies will find it is quicker and less expensive to develop [offerings] using service-

(continued on page 15)

WASHINGTON UPDATE

BY ANITA TAFF

Congressmen submit ANI privacy bills. Citing privacy concerns, two U.S. congressmen are seeking to prevent corporations from being able to market information collected from customers calling 800, 900 and local telephone numbers.

Rep. Edward Markey (D-Mass.), chairman of the House Telecommunications and Finance Subcommittee, introduced the "Telephone Consumer Privacy Rights Act" bill. That bill would prohibit firms with automatic number identification (ANI) services from using the information collected for anything other than internal use without customer consent. It would also bar them from disclosing information about the characteristics of customers' transmissions, including transmission speeds, and calling patterns and locations.

Markey's bill would allow some exceptions. Transmission of customer number and billing information to an outside source would be permitted if it is necessary for billing and collection, completion of the customer's call or for other services directly related to the call.

The bill also would allow passing caller information for calls within the same Centrex or private branch exchange to emergency 911 services, and for legally authorized call tracing or tapping.

As currently written, the bill would apply to any call — local or long-distance. Local carriers do not offer ANI services, known as caller ID, in all states. Additionally, the only long-distance calls for which carriers currently offer ANI services are 800 and 900 services. ANI is not offered on 1+ calls.

The bill would require that callers be given the opportunity to block the transmission of their phone number over ANI

(continued on page 15)

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Delta to upgrade Centrex net, get alternate routing

By Bob Wallace
Senior Editor

ATLANTA — Delta Air Lines, Inc. recently signed a five-year, $5 million fixed-price contract with Southern Bell Telephone and Telegraph Co. to upgrade its analog Centrex system to a specially designed, distributed 7,000-line digital Centrex network with alternate pathing.

Southern Bell has agreed to replace the AT&T Network Systems Group 1AESS analog central office switch in its East Point central office here with a new digital 5ESS switch to deliver Digital ESSX service to Delta.

The Bell operating company will install the Centrex system in November and expects it to grow to 9,000 lines by 1996. Delta will become one of the top five Centrex customers in Georgia by year end.

Southern Bell will off-load Centrex support for Delta from the 1AESS to the first installed portion of the 5ESS without disrupting other existing analog Centrex customers. When the remaining portion of the 5ESS is installed in 1992, other customers will be transitioned to the digital switch.

In addition, the carrier will install eight remote optical switches, which each support 1,000 lines. The switches will be linked via fiber to the 5ESS on or near property that Delta leases from the city of Atlanta.

The Centrex system will connect three existing Delta facilities — its headquarters and two Hartsfield, Ga., Terminal Operations — as well as two sites currently under construction.

As part of the upgrade, Southern Bell will install diverse fiber routes from the remote switch modules back to the 5ESS to eliminate the possibility of a fiber cut that would down service to the airline for a prolonged period. If the 5ESS is knocked out, the remote modules will continue to provide Centrex service to end users.

"Reliability was a key reason why we selected Digital ESSX," said Robert Woodyard, assistant vice-president of communications for Delta. "We rely heavily on communications to run our business, and Southern Bell's design is the most reliable architecture available based on our requirements."

Richard Snelling, executive vice-president of Southern Bell network for BellSouth Corp., said the system has been designed so that no one incident will be able to take the entire network down. "The system we designed for Delta includes redundant components and diverse routes in and out of the central office."

Delta will use an on-site Digital ESSX Centrex Administration Service terminal to perform station moves, adds and changes.

Kenny Poland, Delta's account manager for Southern Bell, said the carrier will equip the 5ESS to support Integrated Services Digital Network and will provide an unspecified number of ISDN 1B+D lines.

These lines will not initially be equipped to support circuit- or packet-switched data transmission. The 64K bit/sec B channel will be used for circuit-switched voice, and the 16K bit/sec D channel will be used for call setup and teardown. ☎

Delta will become one of the top five Centrex customers in Georgia by year end.

▲▲▲

Washington Update

continued from page 13

services free of charge. Although the blocking idea has been widely discussed and implemented in some states, it is the first time anyone has suggested allowing 800 or 900 customers to block their numbers. Sen. Herb Kohl (D-Wisc.) also introduced the "Telephone Privacy Act" this month, which closely parallels Markey's bill. It would allow caller ID or ANI services only if the customers placing the calls can block the transmission of their number. The bill has the same exemption for 911 services.

Kohl introduced a similar bill last year, but there was no action on it when Congress adjourned.

FCC looks at abuses. The Federal Communications Commission took steps earlier this to month to restrict corporate use of fax machines to distribute unsolicited advertising and the use of autodialers to dial calls for telemarketers.

As part of a larger proceeding investigating unscrupulous 900 service providers, the FCC asked the industry to comment on whether telemarketing practices using fax machines and autodialers have become abusive and whether rules are needed to curb the problem.

Consumers have complained that unsolicited faxes tie up fax machines that are needed for business purposes and impose costs on recipients because they must pay for expensive thermal paper required by most fax machines.

Consumers have also complained that autodialers fail to disconnect after the phone is hung up. Richard Firestone, the FCC Common Carrier Bureau chief, said that disconnect times on autodialers would range from 10 to 20 seconds.

However, some consumers have reported autodialers maintaining connections for as much as five minutes.

This issue has caught the attention of congressmen who complain that consumers might be prevented from placing an emergency call while their phone is tied up by an autodialer.

They also express concern that because autodialers go down phone lists in numerical sequence, they dial into and tie up critical phone lines such as those at hospitals and police departments.

Earlier this month, Edward Markey (D-Mass.) introduced a bill limiting unsolicited telemarketing without live operators. ☎

AT&T releases AIN devices

continued from page 13

independent platforms than network switches."

A host of other vendors, including Northern Telecom, Inc., Digital Equipment Corp., Ericsson, Inc. and Tandem Telecommunications Systems, Inc., also sell SCPs.

AT&T's new SCP product will let telephone companies support SCP data bases in order to provide call control and routing for advanced services.

With follow-me services, for example, users will be able to program a daily itinerary into the network and the SCP will see to it that the calls are forwarded from site to site.

The SCN software will be used to control and connect calls to advance services, such as voice mail, facsimile store-and-forward and voice recognition offerings.

The SMS offering is a management system that enables telephone companies to test, administer and provision advanced intelligent network services. SMS is based on AT&T's common Operations Systems platform and will be compatible with Bellcore's Operation Systems Computing Architecture, a standard for operations support systems.

The final component, the SCE, is an application development tool that runs on a Sun workstation and simplifies the creation, testing and deployment of new services.

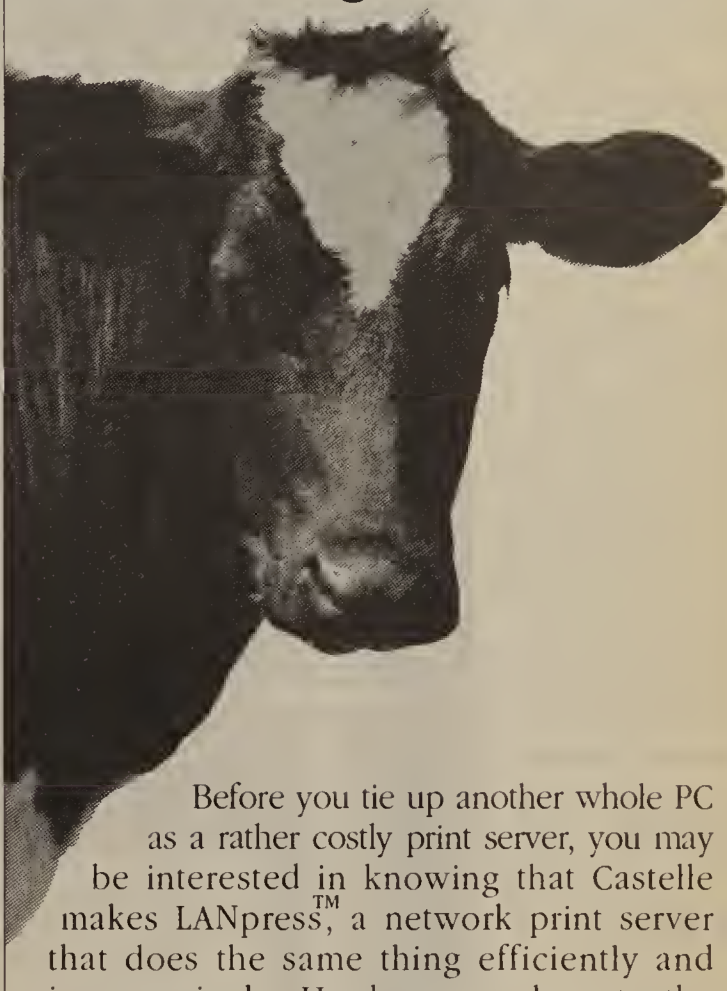
AT&T announced that BellSouth Corp. has agreed to two multiyear contracts to purchase a number of these products. BellSouth, the first regional Bell holding company to buy A-I-Net products, has named AT&T its primary AIN product vendor.

The A-I-Net products are expected to be generally available in July.

Contract terms

Under the contracts, BellSouth will buy AT&T's first AIN product, its Advanced Services Platform, a set of software programs for the 5ESS and 1AESS central office switches that enables them to communicate with adjunct processors. The RBHC will also buy AT&T's SCPs, SCNs and SCEs. ☎

It would be like buying a cow for a glass of milk.



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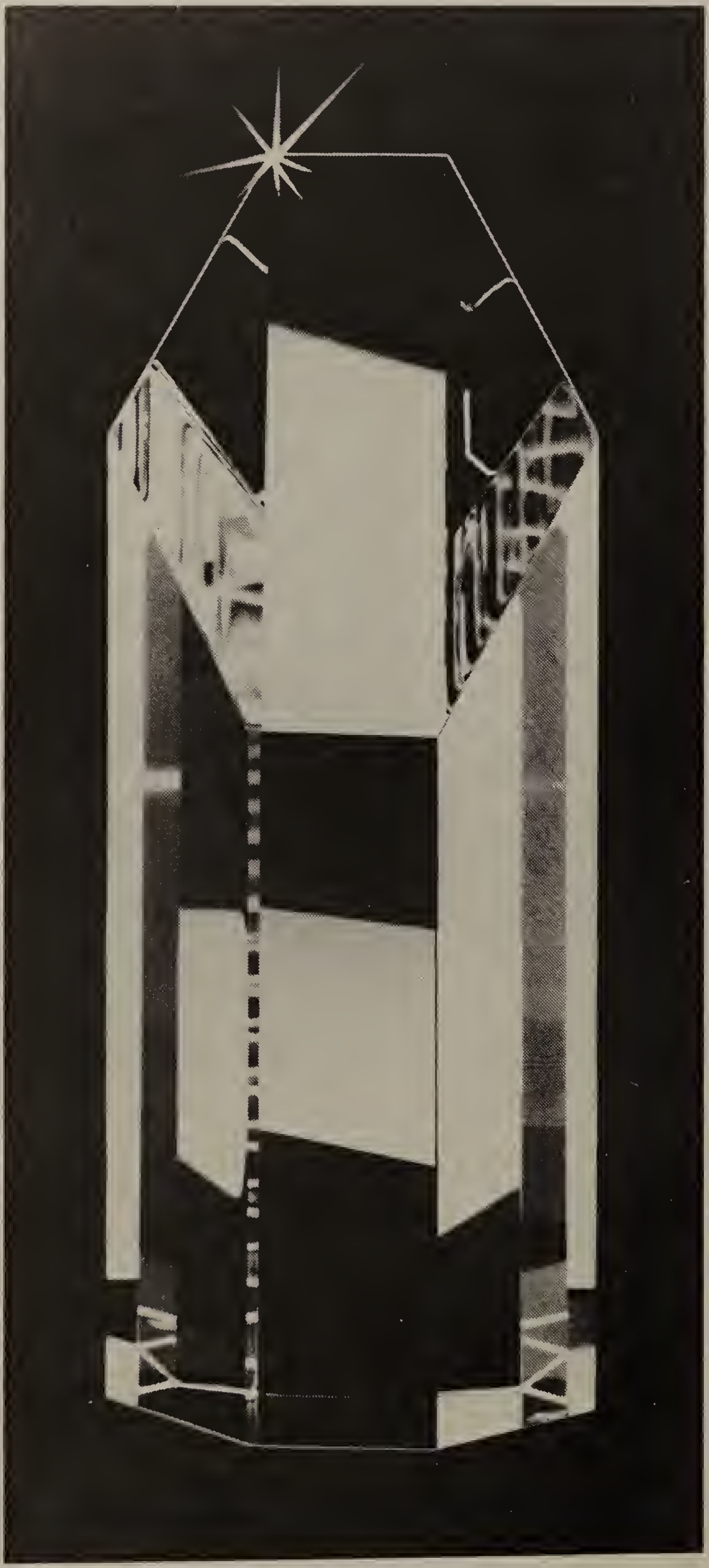

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

Rockwell International Corp.'s Digital Communications division recently shipped its 13-millionth 9.6K bit/sec facsimile modem, which the company claims is used in more than 70% of the fax machines installed worldwide.

Data Packets

Cisco Systems, Inc. and **NEC America, Inc.** last week announced they are jointly developing a Switched Multimegabit Data Service (SMDS) interface for Cisco's router that will operate at the T-3 rate of of 44.736M bit/sec.

Earlier this month, Cisco announced a 1.544M bit/sec SMDS-compliant interface for its routers and said the T-3 interface was under development.

The T-3 interface will be similar to the T-1 SMDS interface in that it consists of two parts: Cisco-developed software for its high-end multiprotocol AGS+ bridge/router and an NEC-developed SMDS data service unit/channel service unit dubbed the SMDS Adaptor.

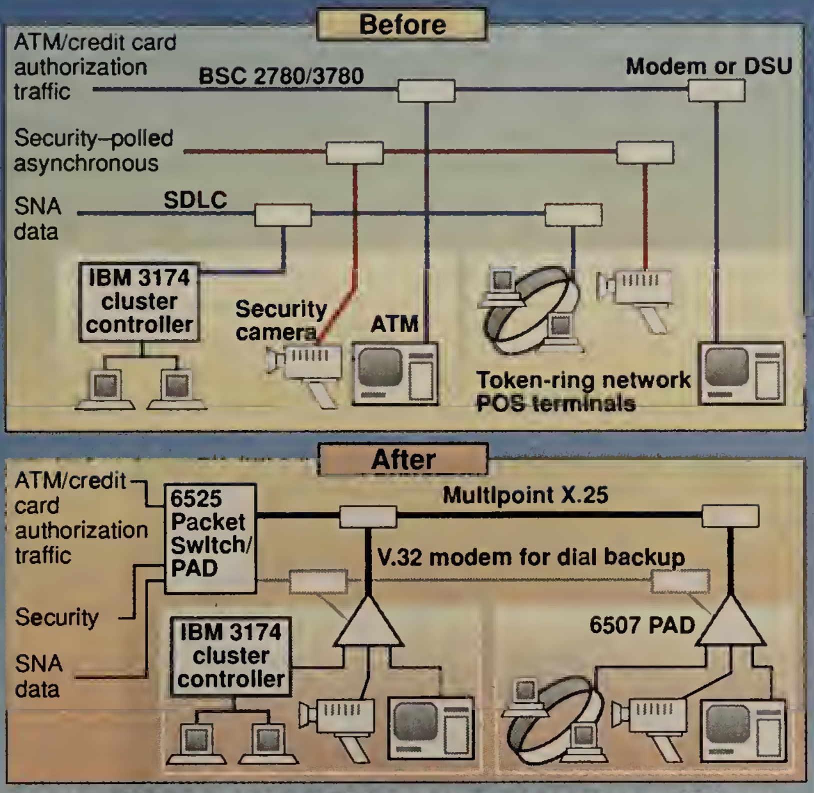
Cisco will sell both components with its AGS+, as will NEC with its NEAX 61E SMDS Service Node switch.

The new interface , which is scheduled for fourth-quarter availability, was demonstrated at last week's Supercomm '91 conference in Houston.

WORLDSPAN Travel Agency Information Services last week anounced it has signed **CompuServe, Inc.** to a five-year contract to provide travel agents and other users with dial-up access to WORLDSPAN hosts.

Approximately 25% of WORLDSPAN subscribers in the U.S. use its dial-up products, and 99% of those users employ CompuServe to access those products. ☑

Codex switch helps users trim line costs


Before
ATM/credit card authorization traffic
BSC 2780/3780
Modem or DSU
Security–polled asynchronous
SNA data
SDLC
IBM 3174 cluster controller
Security camera
ATM
Token-ring network POS terminals
After
ATM/credit card authorization traffic
6525 Packet Switch/PAD
Multipoint X.25
V.32 modem for dial backup
Security
SNA data
IBM 3174 cluster controller
6507 PAD

Codex's 6525 Packet Switch/PAD now supports as many as 32 drops per line and 256 drops per switch, plus IBM's BSC protocol. That enables users to reduce line costs by consolidating multiple protocols onto a single X.25 line.

DSU = Data service unit

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: CODEX CORP., MANSFIELD, MASS.

Codex boosts 6500 Series packet-switching products

Adds support for multiple protocols on single line.

By Paul Desmond
Senior Editor

MANSFIELD, Mass. — Codex Corp. last week announced enhancements to its 6500 Series packet-switching equipment, including support for redundant processors and multiple protocols on a single multidrop line.

Codex announced Release 2.0 and 2.1 of its 6500 Series software for the 6525 Packet Switch/PAD, the 6507 PAD and the 6505 Asynchronous PAD.

Release 2.0, which has been shipping since September but was formally announced last week, adds support for IBM's Synchronous Data Link Control protocol to the 6525 and 6507. It also adds support for as many as 16 drops off a single multipoint line from a 6525 switch, according to Bob Burrows, senior director of product marketing for Codex.

The 6507 and 6505 PADs have also been enhanced to support the multipoint feature.

Release 2.1 of the 6500 software expands the multipoint feature to 32 drops per line and to as many as 256 drops per 6525 switch.

The multipoint capability is supported by the proprietary Codex Multipoint X.25 protocol, which adds addressing that enables 6500 series devices on the same line to identify one another, Burrows said.

Also with Release 2.1, Codex added support for IBM's Binary Synchronous Communications 3270 or BSC 2780/3780 protocol.

Combined with the multipoint capability, support for BSC and SDLC is a boon for users in industries such as banking and retail because it lets them combine multiple protocols on the same line, Burrows explained.

Previously, such users would need separate lines for asynchronous security devices, 2780/3780 BSC automated teller machines and credit card authorization terminals, as well as for their traditional 3270 applications (see graphic, this page).

Larry Cynar, senior industry analyst with Dataquest, Inc., a consultancy in San Jose, Calif., agreed that the products should be helpful to users in terms of cost savings and network efficiency.

"I've had discussions with them for quite a while on taking this direction," Cynar said. "I think it's what we're going to see a lot of coming out of these different [vendors]."

Also new with Release 2.1 is support for as many as eight CPUs in the 6525 switch, up from the previous limit of one. When the device's software is brought up, it determines how many CPUs exist and distributes its processing load accordingly.

(continued on page 48)

Apple praises SMDS results in PacBell test

Switched Multimegabit Data Service scores file transfer between LANs at rates up to 800K bit/sec.

By Maureen Molloy
Staff Writer

CUPERTINO, Calif. — Apple Computer, Inc. is nearing completion of a six-month trial of a Switched Multimegabit Data Service (SMDS) from Pacific Bell that the microcomputer maker says has exceeded its performance expectations.

In its trial, Apple is linking Ethernet local-area networks at two sites in the same local access and transport area via a T-1 speed SMDS service. According to project manager Fred Sammartino, the SMDS service has achieved file-transfer throughput between LANs at rates up to 800K bit/sec.

"So far, we've been surprisingly pleased with the trial, especially with the throughput we've achieved," Sammartino said. "We expected more problems with switching the packets, but except for some minor glitches, it's been working beautifully."

SMDS is an emerging, high-speed switched data service being developed by local carriers. The offering will give users an alternative to leased lines for capacity-hungry applications such as LAN-to-LAN interconnection, imaging and full-motion video. Initial SMDS services will be offered at T-1 and T-3 speeds.

A new alternative

In Apple's setup, LANs are linked to Pacific Bell central offices via routers attached to T-1 lines.

Sammartino said the computer maker is interested in SMDS to support wide-area links between LANs, multimedia applications, image and video. With 76 locations in California's Silicon Valley alone, the company is looking at SMDS as a possible low-cost alternative to its current LAN internetwork of end-to-end T-1 lines.

Locations with continuous high-volume traffic requirements would likely remain on leased lines, Sammartino said. But the vast majority of locations with sporadic needs for high bit rate transmission services will likely be migrated onto SMDS.

(continued on page 18)

Fed takes steps to move U.S. banks to ACH network

By Jim Brown
Senior Editor

SAN FRANCISCO — The Federal Reserve System mapped out plans at the recent National Automated Clearing House Association (NACHA) 91 conference here to persuade all banks that use its ACH processing services to link to its network by mid-1993.

By doing so, it hopes to speed the turnaround time for clearinghouse transactions, making it possible, for instance, to move direct deposit payroll funds from an employer to an employee in one day instead of two or three.

The network enables a bank to transmit to the Federal Reserve employee direct deposit payroll files containing instructions to disperse payroll deposits to different employees' banks.

About 2,500 of the 10,000 banks that use the Federal Reserve's ACH processing services are already linked to the network. The remaining 7,500 still submit payment instructions on computer tapes or paper forms that must be manually entered into a Federal Reserve host computer. The Federal Reserve must then create new tapes or paper reports to mail out to banks receiving the payments.

Because many smaller banks are in remote areas, it often takes too long and costs too much to transport tapes and paper forms by courier. Shipping files over dial-up or leased lines to the Federal Reserve at up to 56K bit/sec will trim that time and expense.

"We believe we can achieve an all-electronic ACH system by July 1993," said Richard Oliver, senior vice-president at the Federal Reserve Bank of Atlanta.

The Federal Reserve will entice the banks to comply with the move by hiking the rates it charges to receive or ship computer tapes and paper forms on Jan. 1, 1992, and on Jan. 1, 1993.

"We have to encourage people to install network links as well as to recognize the growing costs of manually handling tapes and paper forms," Oliver said. ☑

Apple praises SMDS results

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"Naturally, it all depends on how the service is priced, and I assume it'll be priced aggressively," he said. "For bursty traffic, it will probably be cheaper to pay by the bit."

Local carriers throughout the country have recently started testing SMDS.

In addition to Pacific Bell — which is also conducting SMDS trials with Stanford University, Pacific Gas & Electric Co. and Tandem Computers, Inc. — other local carriers trialing the service include Bell Atlantic Corp. and BellSouth Corp.

A test of a T-3 SMDS service is being conducted by Bell Atlantic and Philadelphia-based Temple University.

High-speed switching equipment from QPSX Communications is being used to link 16 Ethernets and two token-ring LANs at several Temple campus sites as far as 17 miles apart. The main application supported is transmission of medical images such as X rays.

Larry Lange, an SMDS technical staff member at Bell Communications Research, said the Bell Atlantic/Temple University trial is being watched closely because it is the first trial being performed at T-3 speed, or 45M bit/sec.

Only one carrier has publicly discussed a pricing structure for the high-speed service. A Bell Atlantic spokesman said the carrier will offer two pricing schemes for SMDS — one based on a flat rate and the other based on usage.

Using a flat rate, a customer would pay for a set amount of usage and be charged extra for any usage beyond that. A customer who chooses a usage rate would pay a minimal monthly fee to be connected to the network and then be charged for each byte transmitted.

Although he declined to provide figures, the Bell Atlantic spokesman said the monthly service charge for SMDS will be lower than what users currently pay for private T-1 service.

Besides pricing, another issue that concerns potential users is network management.

Bellcore's Lange said that for many customers, the decision to use leased lines or SMDS will depend largely on the level of control they want over the network. He said some users are leery of SMDS because they believe there are better tools for monitoring performance and reconfiguring private facilities.

> For many customers, the decision to use leased lines or SMDS will depend largely on the level of control they want over the network.
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SMDS will provide a number of data integrity capabilities, including source address validation and destination address screening.

Source address validation is a security feature that checks the source address of a data packet as it enters the network to determine whether it is coming from a device owned by the user. A packet with an invalid source address will not be delivered. The destination address screening feature checks each packet to ensure that it is going to a valid recipient device.

In addition, Bellcore is writing specifications for SMDS network management tools based on the Simple Network Management Protocol that will enable users to monitor network operations and manage addressing.

Lange said users can expect wide-scale commercial deployment of SMDS by most of the major local carriers by early 1992.

Bell Atlantic expects to have commercial deployment of SMDS before year end in five major metropolitan areas: Baltimore, Philadelphia, Richmond, Va., Washington, D.C. and northern New Jersey. ◘

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Worth Noting

"The quicker Novell [Inc.] moves to [NetWare] 3.11, the better. The whole concept of [NetWare Loadable Modules] under 3.11 is vital — there are NLMs for Unix, Oracle [Corp. data bases, the Simple Network Management Protocol] and more. The future is definitely 3.11."

Bill Spencer
President
Network and Communication Technology
Park Ridge, N.J.
and director, New Jersey Novell Users' Group

Netnotes

Matrix Computer Systems, Inc. of Nashua, N.H., has rolled out Version 2 of its EtherView Ethernet network monitoring software. The release runs under the X Window System, allowing it to be supported from any system on the network and displayed from any desktop system supporting X Window.

The software consists of the Load Monitor, NFS Performance Monitor and Protocol Analyzer tools.

EtherView costs $1,995 per tool.

CrossComm Corp. of Marlborough, Mass., has added IBM Systems Network Architecture support to its ILAN series of high-speed remote bridges. The ILAN routing bridges now support Synchronous Data Link Control and High-Level Data Link Control traffic. The SNA support allows users to combine their SNA and multiprotocol local-area network traffic onto a single wide-area link. As many as five SDLC data streams can be combined with LAN traffic over an ILAN wide-area network link.

The module supporting SNA traffic costs $2,000.

Firm upgrades workstation mgmt. tool with data base

New version also supports remote control of PCs.

By Caryn Gillooly
Senior Editor

ST. PAUL, Minn. — Triticom has released a new version of its workstation management software that makes it possible to store workstation configuration information gathered by polling.

According to Triticom President Barry Trent, the inventory data base included in Version 1.3 of Argus/n LAN Workstation Monitor is used in conjunction with existing tracking capabilities to let administrators reach down to workstations and retrieve information about the hardware and software in place.

Instead of constantly querying each workstation for configuration data, the new version of the software will enable administrators to query a data base to create reports detailing machine types and capabilities.

For example, Trent explained, if the administrator wanted to load a new software package onto the network, a data base query would show which machines were based on Intel Corp. 80286 or 80386 processors and which have the available random-access memory to support the program. The administrator would also be able to see which software the user was running.

A remote control feature also lets administrators assume control of a user's workstation, making it easier to locate problems.

"I can't say that the features [of Argus/n] stand out alone, but I haven't seen anyone else put them all together," said J. Scott Haughdahl, senior technical consultant at Architecture Technology Corp. in Minneapolis.

Todd Pierce, a local-area network analyst at Washington Square Capitalin Minneapolis, a test site for the new release, agreed. "One company was touting that it could do hardware inventory, but that was all. Another had remote access but no data base," he said. Argus/n combined all the functionality of other products.

Another differentiating feature is the product's focus on the workstation rather than the server. Most network management products gather information from the server and can collect information from the workstations attached to that server.

Argus/n collects information about workstations by network

(continued on page 48)

DG, IBM unveil additions to RISC computer lines

By Eric Smalley
Senior Editor

Data General Corp. and IBM recently expanded their network server offerings through new additions to their Reduced Instruction Set Computer (RISC) lines.

DG unveiled two four-processor models of its Aviion line that company officials said offer performance of 117 million instructions per second (MIPS). The Aviion computers are based on Motorola, Inc.'s 88000 RISC chips. The new Aviion systems also include eight cache-memory management chips, newly announced by Motorola, that boost memory-to-processor performance.

The rack-mounted Aviion AV 8000 has eight Ethernet ports and can support 1,275 asynchronous terminals, according to DG officials. The AV 8000 can support as many as 520 simultaneous interactive users, according to a company spokesman.

The Aviion AV 7000 is a deskside model that offers the same capabilities.

The Aviion series machines run the DG/UX 5.4 operating system, based on AT&T's Unix System V, Release 4.

Prices for the new Aviion systems begin at $96,000.

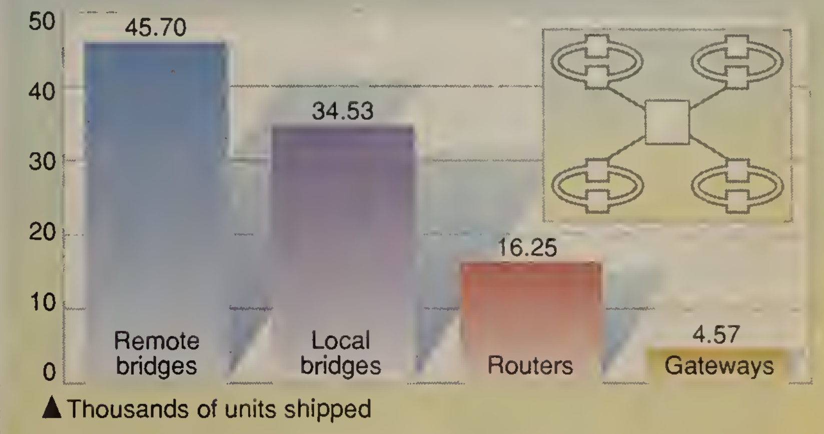
Powerful Powerserver

IBM, meanwhile, released the RISC System/6000 Powerserver 320H, which features a speedier processor than the current Powerserver 320. IBM increased the clock rate of its entry-level RISC processor from 20 MHz to 25 MHz. Big Blue also released a workstation configuration of the 320H and a rack-mounted version of the 41.6-MHz Powerserver 550, called the Powerserver 950.

Prices for the Powerserver 320H begin at $17,970. Prices for the Powerserver 950 begin at $151,380.

The RISC System/6000s run IBM's AIX Unix variant.

Bridges lead 1990 internetworking market



Although the number of remote bridges shipped led the U.S. internetworking market in 1990, routers are poised for explosive growth.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: FROST & SULLIVAN, INC., NEW YORK

Reports cite growth of LAN internet mart

Point to similar trends contributing to explosive market growth for products used to link networks.

By Eric Smalley
Senior Editor

The continued growth of the internetworking market and, in particular, the rapid growth of the router market has been forecasted in three recently released studies.

The reports were issued by Forrester Research, Inc. of Cambridge, Mass., Frost & Sullivan, Inc. of New York and International Data Corp. (IDC) of Framingham, Mass.

The trends identified by the three reports are consistent, though the methodologies, focus and revenue figures differ. The market for internetworking devices will nearly triple from 1990 to 1995, according to the reports.

The installed base of local-area networks and the steady growth of the LAN market are driving the internetworking market as users build and extend organizationwide nets.

The installed base of LANs will increase from 3.7 million in 1990 to 12.7 million in 1995, according to the Frost & Sullivan report.

This will result in the number of discrete internetworking products shipped in the U.S. yearly increasing from 101,560 in 1990 to 378,500 in 1995, Frost & Sullivan projected. Revenues in the domestic market are expected to increase from $607.5 million in 1990 to $1.8 billion in 1995.

Revenue figures from the IDC report are more conservative. According to IDC's forecast, the worldwide internetworking market will increase from $588 million in 1990 to $935.6 million in 1994.

According to the Frost & Sullivan report, growth in the router market will coincide with growth in the remote bridge market. The IDC and Forrester reports forecast router growth at the expense of remote bridges, which are following local bridges toward commodity status.

"We see people using routers instead of bridges even when a router is more than they need," said Janet Hyland, director of network strategies for Forrester. "Routers will basically obliterate the remote bridge market."

All three reports counted combined bridge/routers in the router category.

The Forrester report, which focused on routers, predicts that the U.S. market for routers will increase from $156 million in 1990 to $565 million in 1994.

The internetworking market will experience "consolidation around routing and local bridges with server functions," said Susan Frankel, author of the IDC report.

That study considered Fiber Distributed Data Interface bridges and routers in a separate category. FDDI devices accounted for 6.7% of the 1990 worldwide internetworking market revenues, according to the IDC report.

The Forrester report separated routers into three categories: minirouter, mid-range and high end.

By 1994, minirouters, which are single-board devices priced between $5,000 and $7,000, will constitute the highest number of units shipped, in part through sales for intelligent hubs, according to Hyland.

High-end routers, driven by FDDI, will be the biggest revenue generators in the 1994 U.S. router market, she said.

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

Dialogue

The Federal Communications Commission is once again considering the legality of AT&T's Tariff 12. Do you think the agency should approve the custom network arrangements?

"Yes. We were reviewing a Tariff 12 for our firm but put our plans on hold until we know what the legal ramifications will be.

"Critics see Tariff 12 as a favoritism issue. But if a user can strike a deal with AT&T because of high volume, why shouldn't that be allowed? It's up to us to negotiate with AT&T because we have other alternatives. If AT&T doesn't give us what we want, we can turn to MCI or Sprint."

Harvey Shrednick
Vice-president of information services
Corning, Inc.
Corning, N.Y.

"Yes. I think Tariff 12 should be made legal because it gives corporations better rates and makes the entire process more competitive.

"I view Tariff 12 simply as an extension of open competition."

John Glennon
Director of voice and data networks
Federal Deposit Insurance Corp.
Arlington, Va.

"Yes. I think Tariff 12 stimulates competition. It forces AT&T to do some homework on pricing things competitively and causes the other interexchange carriers to price their services more competitively."

Ron Kopitowsky
Metropolitan Transportation Authority
New York

"Yes, Tariff 12 should absolutely be approved. There's no reason why Tariff 12-type services can't be done by AT&T and the other carriers because they promote open competition. "Obviously, not all users can reap the benefits of a Tariff 12 because it's an economies-of-scale issue; you have to be a big enough user for the carrier to want to negotiate a deal with you."

Sid Smith
Manager of telecommunications
Crowley Maritime Corp.
San Francisco

Attorney discusses how to avoid E-mail privacy woes

Employers should be up-front about office policy.

By Salvatore Salamone
Features Writer

WASHINGTON, D.C. — Lawsuits over electronic mail privacy may be a thing of the past — or at least they should be, says Noel Shipman, the attorney who represented employees in the two recent landmark E-mail privacy cases.

Shipman, speaking at the EDI and the Law '91 conference here, said firms can avoid legal entanglements by developing policies on E-mail privacy and making them known to their employees.

The attorney advises users to make it known that information on computer systems is company property.

"Companies should make it clear that everything on the computer will be read," said Shipman, who was involved in E-mail privacy suits brought against Epson America, Inc. and the Infiniti Division of Nissan Motor Corp. "This is the only way to protect against invasion of privacy lawsuits."

While Shipman does not believe that companies should be reading electronic documents and messages, he said companies have to maintain that right in order to legally protect themselves. He acknowledges, however, that such a policy will curb the use of E-mail.

Other speakers agreed with Shipman that such policies are necessary but are split on whether they would curtail E-mail usage. "E-mail has grown even with tough policies in place," said Lee Foote, manager of E.I. du Pont de Nemours & Co.'s corporate electronic security.

Jack Welsh, Eastman Kodak Co.'s director of records management and information security services, agreed. He said Kodak, whose policy gives the company the right to monitor all electronic information, has witnessed dramatic growth in E-mail usage.

Basically, both du Pont and Eastman Kodak have adopted the policy that Shipman suggested: Everything on the network is company property and can be read. "We don't feel that we have to preadvise a user for us to look

(continued on page 22)

EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Foundation established for EDI research. The ANSI X12 committee, which establishes standards for electronic data interchange, recently established a foundation to fund research and educational programs devoted to EDI.

The Data Interchange Standards Education and Research Foundation, based in Vienna, Va., will offer grants and fellowships to support research on EDI. The results of the research will be disseminated through lectures, seminars, exhibits, publications and libraries.

Funding will come from trade associations, other foundations, suppliers of EDI products and services, and corporate EDI users. For more information, call Clifford Buys, foundation president, at (703) 938-6806.

Guide for writing net job descriptions out. Writing job descriptions for network professionals can be a time-consuming and difficult process.

The *Definitive Guide to Job Descriptions: Telecommunications,* published by TeleCom Clinic, may help ease the burden. It contains 100 descriptions of network jobs, including network directors, managers, technical support personnel, analysts and programmers, voice processing specialists, telephone operators and clerical workers.

Each job description lists title, basic function, duties and responsibilities, manner of supervision and qualifications. The guide comes as a 240-page, three-ring binder or in a 3½-in. floppy disk. The three-ring binder costs $49.99; the binder and disk cost $64.99.

To order, contact TeleCom Clinic, 469 Tenafly Road, Englewood, N.J. 07631; (201) 568-2640. ◘

"While technical knowledge is important for a CIO, it's third on the list. The most important skills a CIO must have are an ability to motivate a team and an understanding of business concepts and principles."

Bud Mathaisel
Director, Center for Information Technology and Strategy
Ernst & Young
Boston

Exec promotes IS, worker alignments

Ernst & Young partner suggests downsizing from mainframes to workstations, forming staff teams.

Q&A The key to leveraging information technology for business advantage is to "democratize" computing, says Bernard Mathaisel, a partner at Ernst & Young and former chief information officer (CIO) at The Walt Disney Co.

This means downsizing from mainframes to workstation platforms where possible and forming teams of users and information systems (IS) staff to examine both business processes and potential uses of technology, Mathaisel says.

Ernst & Young recruited Mathaisel to head its new Center for Information Technology and Strategy, a consulting think tank in Boston devoted to exploring the relationship between technology and business strategies.

Network World Senior Writer Wayne Eckerson recently spoke with Mathaisel about strategies for implementing and managing information technology.

Many executives have recently recognized the importance of redesigning business processes — streamlining information flows and eliminating wasted and redundant steps — before applying information technology. Why the sudden interest in business process redesign?

Business process redesign is fundamentally the same as change management, which is what good consultants and IS managers have been stressing for 20 years.

What is different today is that information technology is receiving more emphasis.

Unfortunately, there are few established procedures for making business process redesign work. Until now, it's all been rather conceptual and abstract.

Users who hear about business process redesign are eager to try it but are usually in the dark about how to do it.

It often helps users to consider how an enabling technology, such as image processing, could help them do things better or differently. Eventually they catch on and begin seeing ways technology can help them rearrange business processes.

Are companies getting better at aligning technology and business objectives?

"There are few established procedures for making business process redesign work. Until now, it's been rather abstract."

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Some firms have succeeded, but others are in no better shape than they were before. The key to narrowing the gap between the IS organization and users is to democratize computing — in other words, make IS resources available to everyone in the firm.

Companies that are least successful in aligning technology and business tend to be large mainframe shops with little work group or client/server computing. If you keep that hierarchical, mainframe-oriented structure, it's very unlikely that you are go-

(continued on page 22)

Group presses health care suppliers for EDI standard

By Maureen Molloy
Staff Writer

DALLAS — Twenty-two multihospital groups representing more than 70% of the nation's medical centers this month joined forces in a national association to push for an electronic data interchange standard for the health care industry.

The Health Care EDI Association will ask suppliers in the health care industry to adopt a uniform EDI standard that will lower costs and expand buying options for hospitals by allowing them to deal directly with more suppliers.

"The goal is to let any hospital order any item — be it medication, bandages or an X-ray machine — from any supplier it chooses," said Roger Cadaret, project leader at the Detroit office of Ernst & Young, the consulting firm that helped form the EDI association. "A greater availability of EDI suppliers will allow hospitals and hospital groups to negotiate lower prices."

Away from proprietary

Cadaret said the group will help the health care industry move away from what is now a largely proprietary environment in which hospitals order supplies electronically from a single vendor's order entry system.

"In today's environment, with the opportunity of EDI standards out there, it doesn't make sense to cling to proprietary systems any longer," he said.

The wide-scale use of common EDI formats by suppliers would also help hospital purchasing groups by providing them with better information about their members' purchasing habits. These groups, which represent different hospitals, combine their purchasing power to negotiate discounts with suppliers.

> "A greater availability of EDI suppliers will allow hospitals to negotiate lower prices."
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Cadaret said the venture is precedent-setting because it involves a diverse group of customers banding together to specify EDI requirements to suppliers.

In other industries, large customers have typically acted individually to push EDI development.

The association will also work to bring more insurance companies up to date on EDI so that health care facilities can file insurance claims electronically, thereby reducing administrative costs.

Executive promotes alignments

continued from page 21

ing to narrow the gap and put business process redesign in place. Companies are also narrowing the gap between technology and business through joint application development teams. These are groups of end users and IS folks who work together intensively for a short period of time to develop new systems. These teams help bring technology closer to users and facilitate business process redesign.

It is inevitable that the gap between business and technology will narrow in most firms because there is greater awareness of the difference [information technology] can make in an enterprise. In addition, more end users are becoming comfortable with computers, and there are more tools they can work with, such as object-oriented programming.

Is IS making any progress in speeding application development?

There is an interesting duality. We see an emphasis on delivering large infrastructure systems better through [computer-aided software engineering] tools, and we also see an emphasis on doing things quickly with local-area networks without the full rigor of CASE.

There are large applications, such as payroll, that must be done on mainframes, but there are other applications more amenable to a workstation environment.

At Disney, we initially wanted to develop a marketing information system on a minicomputer with a fourth-generation language. It was going to cost $1 million and would take about seven months. We ended up building the system in 30 days for $90,000 using a Sybase [Inc.] relational data base on a Sun workstation.

Amazingly, building systems on a workstation platform seems to compress the time it takes to analyze user requirements. I think this is because it is much easier to manipulate applications on a workstation platform than on a mainframe.

Is there any rule of thumb for when companies should downsize from mainframes to workstations and minicomputers?

Companies are running fewer and fewer applications on mainframes. Actually, the philosophy seems to be that what you can't do on a personal computer, you do on a LAN using client/server computing. If you can't support it on a local network, then you move to a minicomputer. If you can't do it on that, you use a mainframe.

> "One of the difficulties of being completely nontechnical is that you can get talked into something. And all you need is a couple of failures and you're gone."
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Some have said that "CIO" means "Career is Over." Do you agree?

I already sense that the world is moving away from the term "CIO." There will be a technology manager in the firm. But increasingly, companies are appointing nontechnical people into the top jobs.

In the last two days, I've seen two major organizations that appointed their top human resource executives to run IS. You can imagine what happened within the IS organization. But the two individuals are doing wonderfully because they are sensitive to the team concept. If you use the team concept wisely, you don't have to know about the technologies yourself.

However, I believe that CIOs should have some technical knowledge. Knowing technology enabled me — as CIO at Disney — to avoid projects or investments that didn't make sense or that would have been dead ends. One of the difficulties of being completely nontechnical is that you can get talked into something. And all you need is a couple of failures and you're gone.

However, more important than technical knowledge is a CIO's ability to motivate a team and understand business concepts and principles. It also helps to be sensitive to user needs and be able to figure out what they really want and need.

Do you recommend that IS executives experiment with new work practices such as self-managed teams, job swapping and peer evaluations within the IS organization?

I would like to see more rotation of jobs within a firm and see people move out of IS and into user organizations. I would like to see users move into IS because I think genetic diversity breeds brilliance. When you get that mixing, you get much better groups on both sides.

People shouldn't worry that their technical skills will get rusty if they move to another part of the company. You can pick up the technical skills easily — it's like riding a bicycle. That's not the important part; the important part is being able to make decisions and being able to motivate people.

Companies find outsourcing attractive for many reasons. But can a company ever afford to give up control of an IS operation, even if it isn't mission-critical?

Outsourcing is a wonderful idea when done selectively and logically. Companies should never give away control of their operations and should only outsource nonmainstream services that can be done better by outsiders.

I outsourced Disney's computer operations in Europe when the firm decided to open a Disneyland in France. It was logical.

I realized that I didn't know how to hire people in that country. I fired the first two DP managers I hired, and I didn't know how to manage them from Burbank [Calif.]. So we outsourced the data center and some application development to a third party. We let the outsourcing firm build the systems from scratch and get them running. However, we intend to take control of it in five to seven years.

Also you don't outsource something that is in deep trouble just to get it off your hands. It's like pulling the pin of the hand grenade and throwing it over the wall: It's not going to get any better.

There are those who argue that if you write the right contract, then you could always take back control. But when you give away all your people and equipment, how are you going to take back your operations?

Avoiding E-mail privacy woes

continued from page 21

at company assets," Foote said.

But Foote and Welsh made it clear that managers are not reading E-mail. "None of us wants to be in the business of being Big Brother," Foote said.

Welsh said Eastman Kodak will only look at electronic information, including E-mail messages, under special circumstances.

He explained that there are only three reasons a manager would be empowered to look at personal files or messages: if someone is leaving the company; if necessary to resolve a technical problem; and if a person is a known abuser of the system.

Getting the word out

"A company not only needs to have a policy on E-mail privacy, it has to tell its employees what the policy is," stressed Michael Cavanagh, executive director of the Electronic Mail Association. But telling everyone seems to be the hard part.

Some companies, such as United Parcel Service, Inc., simply display a message that spells out the company policy when a person logs onto the network.

Eastman Kodak has taken a different approach. "When people apply for a new computer account, which gives them access to E-mail, we require them to sign a statement that states our policy," Welsh said. "This shows they've read the company policy." That document is then made part of the employee's permanent record.

Signing off

Du Pont's Foote is also trying to establish a sign-off procedure. But it is not a simple matter — he has to reach 95,000 E-mail users worldwide, who transmit more than one million messages per day.

Foote said du Pont has an annual safety sign-off process in place and he may try to link the E-mail policy sign-off with that procedure.

Shipman said he believes that instituting such sign-offs will curtail invasion of privacy lawsuits. "If you inform people from the very beginning about privacy issues, I would have no lawsuits," Shipman said.

While many want to believe Shipman, Foote offers a word of caution. "We're starting to get local legislation," Foote said. "In some cases, it says, 'You may have a policy, but we have a law.'

"This makes it difficult to execute a uniform, companywide policy," he said. "For example, which local laws apply if I have a user in California who sends an E-mail message that is stored on a mainframe in Oklahoma, and then that message is forwarded to another user in Maryland?"

INTERNATIONAL NETWORKS

USER STRATEGIES, INTERNATIONAL SERVICES & REGULATION

World News

US Sprint Communications Co. last week announced plans to extend its Global Virtual Private Network service to Belgium, where users will access the offering via the domestic virtual network service of the country's monopoly carrier, Regie des Telegraphes et Telephones (RTT). A US Sprint spokesman said the virtual net link to Belgium will be available in the second half of this year.

US Sprint also announced plans to interconnect its SprintMail electronic mail service in London with the RTT's DCS Mail via X.400. Additionally, the carriers said they will support one-stop shopping for international private lines. This arrangement will enable users to utilize either US Sprint or the RTT as a single point of contact for ordering and provisioning international private lines between the U.S. and Belgium.

Separately, **Belgium's RTT** last week said that it has formed a joint venture company with Alcatel Bell and the Comincom of the Soviet Union, dubbed Combellga, which will build and operate an overlay network in Moscow. This network will supplement the existing public net and will be used to carry international network traffic to and from Moscow.

Traffic will be routed via an international gateway maintained by the RTT in Brussels, Belgium. The RTT said the overlay network will help improve the quality of international communications to and from the Soviet Union. ◼

INTELSAT opens door for international service rivals

Group OKs limited switched service competition.

By Barton Crockett
Senior Editor

WASHINGTON, D.C. — The International Telecommunications Satellite Organization recently approved petitions by two private satellite companies to provide limited switched services in competition with INTELSAT members.

The decision marks the first implementation of a new INTELSAT policy allowing private satellite companies to provide as many as 100 international switched voice circuits ("State Dept. changes stance on int'l switched services," *NW*, Dec. 24, 1990).

Previously, INTELSAT held a monopoly over the provision of all international switched telephone services via satellite. But user groups, including the International Telecommunications Users Group, have argued that the monopoly should be dropped because greater competition would lower prices and improve services.

While the rule change will only result in limited competition because of the 100-circuit limit, observers say the move will increase pressure for further reform and, at the very least, make new satellite facilities available in areas where they are needed.

"I think these approvals are a clear indication that the liberalization process within INTELSAT is working well and has been implemented effectively in the context of specific requests," said Maury Mechanick, vice-president for INTELSAT policy and representation at Communications Satellite Corp., based here.

COMSAT is the monopoly provider of capacity on INTELSAT satellites to satellite service providers in the U.S. INTELSAT is a 120-nation treaty organization that operates a global satellite system used to provide most of the world's international satellite services.

INTELSAT currently receives more than half of its revenue from the provision of international telephone services via satellite.

Service to three continents

INTELSAT's Board of Governors approved requests by Alpha Lyracom Pan American Satellite Corp. (PANAMSAT) and Australian Satellite, Pty., Ltd. to provide as many as 100 international switched telephone circuits each at a meeting here earlier this month.

In the PANAMSAT petition, INTELSAT said it would not object if the company provided a total of 100 public switched telephone circuits to the Bahamas, Costa Rica, the Dominican Republic, the U.S. and Eastern European countries.

PANAMSAT officials plan to use this approval to provide international switched services to Eastern European countries that need new capacity and to a startup carrier in the Dominican Republic.

The company is also asking INTELSAT and the Federal Communications Commission to drop all restrictions on the provision of international telephone service by private satellite companies.

INTELSAT also authorized Australian Satellite to provide as many as 100 public telephone circuits to Australia and to New Zealand. Both PANAMSAT and Australian Satellite still need

(continued on page 24))

US Sprint's international private-line service

Name: International Clearline

Countries served: Belgium, Bermuda, Canada, France, Ireland, Netherlands, Switzerland, U.K. and Germany

Monthly charge for half-channel to Western Europe*

Line speed (bit/sec)	Cost
56K	$2,900
64K	$2,900
128K	$5,100
192K	$7,200
256K	$8,750
384K	$10,260
512K	$12,750
768K	$17,000
1.544M	$25,500
2.048M	$30,500 **

* For circuit originating in Boston, Chicago, Cleveland, Detroit, New York, Newark, N.J., Philadelphia, Pittsburgh, Washington, D.C. or White Plains, N.Y.
** Available only from New York.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: US SPRINT COMMUNICATIONS CO., KANSAS CITY, MO.

US Sprint to offer new global services

Carrier plans to extend private lines to Asia, Mexico, South America, offer new discount plan.

By Barton Crockett
Senior Editor

KANSAS CITY, Mo. — US Sprint Communications Co. is planning a major expansion of its international private-line offerings that will include extension of service to Asia, Mexico and South America, and new a volume discount plan.

These announcements, scheduled for coming months, will improve the carrier's ability to provide users with global private networks. Additionally, they will enable US Sprint to compete more effectively against carriers such as AT&T, MCI Communications Corp., TRT/FTC Communications, Inc. and World Communications, Inc., all of which currently provide international private-line services to more countries than US Sprint.

"Competition is a wonderful thing, no matter where it shows up," said Chuck Papageorgiou, an international network manager at United Parcel Service, Inc. in Paramus, N.J.

Currently, US Sprint only offers international private-line service to Canada and Western Europe (see graphic, this page).

US Sprint said it expects to launch its international expansion next month, when service is scheduled to commence on a new transpacific submarine fiber cable called the North Pacific Cable ("Transpacific cable to provide lower rates," *NW*, March 18).

Ross Eilbacher, US Sprint's director of international private-line product planning, said the carrier will use the capacity it owns on the North Pacific Cable to provide digital private-line service to Japan and other major Pacific Rim countries. Although US Sprint will file tariffs for these services in the next few weeks, he declined to specify the transmis-

(continued on page 24)

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INTELSAT opens door for rivals

continued from page 23

approvals from local governments in order to provide public switched services. But because most governments base their international satellite regulations on INTELSAT policies, these approvals are expected.

However, INTELSAT delayed ruling on petitions by the U.S. and Germany requesting that some carriers use the Soviet Union's Intersputnik satellite system for the provision of international public switched telephone services.

According to a source who attended the Board of Governors meeting and spoke on the condition of anonymity, the decision was delayed because of concerns about whether the amount of circuits requested exceeded the 100-circuit maximum set by INTELSAT as the highest number of circuits it would approve without question.

Specifically, the U.S. government requested a total of 90 circuits on Intersputnik facilities to meet requests made by AT&T, MCI Communications Corp. and TRT/FTC Communications, Inc. Germany asked for another 10 circuits.

But the Board of Governors was unsure whether the 88 switched circuits Intersputnik already provides between the Soviet Union and other countries needed to be counted as part of the 100-circuit limit. ☒

US Sprint offers new services

continued from page 23

sion rates and prices the carrier will offer.

Eilbacher added that US Sprint later this summer will offer private circuits via satellite to "points in the Pacific where it is justified by demand."

He said US Sprint also will begin providing private-line service to Mexico within 30 days. The cost for the portion of a U.S.-to-Mexico circuit supplied by US Sprint will be about the same as that for a domestic private line of the same length and capacity. Users with U.S. locations near the Mexican border will enjoy discounts, Eilbacher added.

Later this year, US Sprint plans to begin offering digital, satellite-based private-line service to Argentina, Brazil, Chile and Venezuela, Eilbacher said.

The new services will be complemented by a new pricing structure. Eilbacher said that within about 30 days, US Sprint will tariff a discount plan that will offer price breaks based on total private-line expenditures rather than on the duration of the contract, which is currently the only discount tariffed by the carrier.

Specifics on the new discount pricing plan were not disclosed.

Analysts said the expansion will make US Sprint a stronger player in the international services market.

"The truth of the matter is that if you're going to be in the international business, you've got to be in the international private-line market," said Martin Morell, senior telecommunications consultant at Lynx Technologies, Inc., an international network consultancy in Little Falls, N.J.

Morell said US Sprint's new service introductions represent a shift in strategy.

Previously, US Sprint focused its efforts on providing international virtual network services and transmission services via its SprintNet international public data net.

Morell said US Sprint appears to have acknowledged that these services alone will not be sufficient and that it needs to be a provider of international private lines around the world. He described that shift as a sound strategic decision that will help US Sprint increase its international business.

But analysts downplayed the impact US Sprint will have on other carriers.

For example, US Sprint's international private-line services to Europe cost about $400 to $500 less per month than AT&T's and MCI's prices, which is generally not enough to persuade users to switch carriers.

If US Sprint continues this pricing strategy with its new services, little price competition will result, analysts said. ☒

PANEL OF EXPERTS

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PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Videoconference system supports switched links

GPT Video Systems recently announced **i-Link,** a roll-about videoconferencing system that supports dial-up connections.

The new system includes a GPT System 261 coder/decoder (codec), 25- or 35-in. color monitor, and color camera with zoom, pan and tilt functions. It can use low-speed (switched 56K or 64K bit/sec and 112K or 128K bit/sec) and high-speed (384K to 2.048M bit/sec) lines.

The i-Link supports the CCITT H.261 standard, which is just one of a group of standards that constitutes the Px64 specification for interoperability among videoconferencing systems. It is the firm's second roll-about system, and it can transmit images at 30 frame/sec to offer full-motion picture quality.

According to GPT Video, when operating over low-speed switched connections, the unit is best suited for one-on-one videoconferencing meetings.

GPT Video said i-Link, which is available now, costs $80,000 for an average system including a single monitor and one codec.

GPT Video Systems, 737 Canal St., Stamford, Conn. 06902; (203) 348-6600.

NSA offers 3270 driver for Teleos BRI board

Network Software Associates, Inc. (NSA) recently announced a software driver for Teleos Communications, Inc.'s B101 Basic Rate Interface (BRI) board that will enable users to establish IBM 3270 terminal-emulation sessions over Integrated Services Digital Network links.

The new driver for NSA's AdaptSNA 3270 software enables the B101, which fits into an IBM 3174 Establishment Controller, to set up 3270 sessions with remote personal computers over ISDN BRI lines. AdaptSNA with the ISDN driver costs $245 and is available for beta testing.

Network Software Associates, Inc., 39 Argonaut, Laguna Hills, Calif. 92656; (714) 768-4013.

LAN Systems offers HP printer pack

NEW YORK — LAN Systems, Inc. recently announced a version of its LANSpool software for Novell, Inc. NetWare local-area networks that supports the high-speed print capabilities of Hewlett-Packard Co.'s new LaserJet IIIsi.

LANSpool Si is server software that runs on NetWare 286 and 386 servers as a Value Added Process or NetWare Loadable Module, and transfers data from a print server queue to a LaserJet IIIsi at up to 100K character/sec.

By contrast, net print jobs typically are transferred to other printers at only 1,000 to 7K character/sec because most printers lack the memory or processing power to handle a faster data flow, the company said.

The LaserJet IIIsi comes with 1M to 4M bytes of memory and an Ethernet or token-ring network adapter to directly attach the printer to a LAN.

The LaserJet IIsi also features a Reduced Instruction Set Computer-based formatter to process text and graphics in less time than conventional printer engines.

"This is a very fast printer with very fast image processing," said Tyrone Pike, president of LAN Systems. "We're acting as the spigot that puts the data on the network fast enough for it to be printed out by the LaserJet."

Because the LaserJet IIIsi employs extremely fast raster image processing, it can handle 160K to 180K byte/sec, he said. "That means it needs something that can feed it at rates in excess of 100K byte/sec, but older print spoolers were designed to support only 60K to 100K byte/sec data transfers."

In order to satisfy the data needs of the LaserJet IIIsi, LAN Systems enhanced its spooler software to support the LaserJet's printer protocols.

In addition to higher performance, the LANSpooler Si software offers a pop-up LANPrint printer selector, enabling users to access printer features, such as duplex printing and printer tray selection, from within their other applications.

LANSpool Si requires either NetWare 2.15 or NetWare 3.1X.

Available now, LANSpool Si costs $395 per printer, although HP is bundling a copy of the software with each Network Printer Interface Card for the LaserJet IIsi.

The HP offer will let a LAN administrator test-drive the software for 30 days at no charge.

For more information, contact LAN Systems at 300 Park Ave. S., New York, N.Y. 10010, or call (800) 235-3374.

Extol translation software for EDI on AS/400s debuts

FRACKVILLE, Pa. — Extol, Inc. recently announced electronic data interchange translation software for IBM Application System/400 minicomputers that supports industry standard EDI formats.

The Extol EDI Integrator, which runs on the AS/400, converts IBM data base files into ANSI X.12 or EDI for Administration, Commerce and Transport (EDIFACT) formats for transmission across public data networks. Conversely, it translates X.12 and EDIFACT files into formats used by the relational data base management system built into the minicomputer's OS/400 operating system.

The Extol EDI Integrator runs five to 10 times faster than IBM's Data Interchange/400 EDI translation software, according to Anthony Baran, president of Extol.

"We paid a lot of attention to the translator design and worked in a few design tricks so performance wouldn't be a factor," Baran said. He declined to explain how the software could outperform rival offerings.

Baran said the software provides flexibility when integrated with the user's data base program. Extol EDI Integrator, which comes with code translation and data mapping options, can provide modifications to file definitions.

He said the software also provides features not offered by IBM. Users of IBM's product have to write a separate application to build EDI files and insert a header, or detail record indicator, at the front of each file. Extol EDI Integrator inserts that data on its own, he said.

The Extol EDI Integrator is available now and costs from $10,000 to $40,000, according to a tiered-pricing plan tied to different AS/400 models.

For more information, contact Extol at 99 North Line St., Frackville, Pa. 17931, or call (717) 874-0695.

Fibermux rolls out LocalTalk support

Firm adds LocalTalk interfaces for Crossbow hub, cards support unshielded twisted pair, fiber links.

CHATSWORTH, Calif. — Fibermux Corp. last week announced LocalTalk interfaces for its Crossbow wiring hub, making it possible to support LocalTalk, Ethernet and token-ring local-area networks from the same box.

LocalTalk — an Apple Computer, Inc. microcomputer LAN that operates at 230.4K bit/sec — is supported through two new Crossbow I/O modules: the CC6613AT for use with unshielded twisted-pair wire, and the CC6610AT for use with unshielded twisted pair and fiber optics.

The unshielded twisted-pair interface supports hub-to-desktop cable runs at distances as far as 3,000 feet, while the fiber interface supports distances of as many as three kilometers.

The fiber ports on the CC6610AT are intended mainly for linking hubs or for supporting LocalTalk links in electrically noisy environments such as factory floors.

The CC6613AT has 12 female RJ-11 unshielded twisted-pair ports, while the CC6610AT has eight female RJ-11 ports and two pairs of fiber connectors (SMA or ST style).

The Crossbow is an existing workstation networking hub that is available with two, four or 10 slots for I/O modules.

According to Steve Storozum, the new LocalTalk interfaces will support any LocalTalk-compatible network device.

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Existing interface modules are available for Ethernet, supporting thick or thin coaxial cable, unshielded twisted pair, shielded twisted pair or fiber, and for token ring, supporting unshielded or shielded twisted pair or fiber.

According to Steve Storozum, Crossbow product manager, the new LocalTalk interfaces will support any LocalTalk-compatible network device.

The modules also support a cable-level integrity check that enables network administrators to determine the condition of their LAN cable plant.

This is achieved by broadcasting pulses across the spare pair of wire in LocalTalk unshielded twisted-pair installations and having the remote Fibermux media filter wrap the signal around the net and send it back to the hub. Media filters have an RJ-11 port on one side to accept the unshielded twisted-pair link from the hub and offer a DB-9 or DIN-8 device interface on the other.

The modules also support an integrity check that enables net administrators to determine the condition of their LAN cable plant.

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The hubs can thus determine if the circuit is contiguous, a base-level check for network management.

Test results can be forwarded to a network management console — a Sun Microsystems, Inc. Unix-based or a DOS-based personal computer — running Fibermux's LightWatch net management software.

LightWatch is a menu-driven package that enables administrators to control every network port from a single location.

According to Storozum, supporting LocalTalk on the Crossbow will provide customers with a way to support existing 230.4K bit/sec LocalTalk devices and a migration path for upgrading support to higher speed LAN products.

The unshielded twisted-pair I/O module and the FP6691AT unshielded twisted-pair media filter are available now for $1,350 and $75, respectively. The unshielded twisted-pair/fiber I/O module is expected to be available in May for $1,550.

For more information, contact Fibermux at 9310 Topanga Canyon Road, Chatsworth, Calif. 91311, or call (818) 709-6000.

The hands on the clock were

yesterday. A museum of

And as the Hula-Hoop®
REG. T.M. OF KRANSCO

impending doom closed

burst into the small

large metal switching

And I said in a voice

turn into a Nehru

then, above the hiss of

"Relax. You bought an

you expand, up to 90%

Investment protection . . .

be yours." And as I drove

I felt good because life, after

AT&T DEFINITY Communications System. We're sure it will last a long time. For more information or a free copy of *waving good-bye. . . . I cleaned the garage*

obsolescence. Go-go boots and lava lamps.

settled around my ankles, this feeling of

in on me like night. So I rushed to work,

room most people avoid and stared at this

device sitting there Buddha-like in the dark.

soft as a prayer, "Don't get old on me. Don't

jacket. Grow. Expand. 30,000 lines." And

the air conditioner, I heard this voice say,

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VENDOR ALLIANCES

BY JEFFREY KAPLAN

Getting the most from service alliances

Recent announcements involving strategic vendor alliances that focus on joint service and support have important implications for users and should be evaluated carefully.

Rather than hide the fact that they do not possess the internal resources to support all of their customers' needs, companies such as Novell, Inc., SynOptics Communications, Inc. and 3Com Corp. have used a series of recent service agreements to allay user fears that they lack comprehensive support. At the same time, their new service partners are repositioning themselves through these support agreements to prove that they have local-area networking capabilities, albeit more implementation-driven than technology-driven.

These agreements can help users because they encourage cooperative working arrangements between vendors and lessen the potential finger pointing that typically arises in multivendor environments. For example, Novell's authorized third-party service partners, called Novell Service Organizations (NSO), have allowed the company to withdraw from providing direct support to most of its customers and permitted the company to concentrate its efforts on developing new products and meeting the unique needs of its largest users.

> Failure to give thorough training to the support staffs can lead to ineffective service.
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On the other hand, these arrangements can have a lot of pitfalls. Small manufacturers must still train and back up the vast nationwide or worldwide support organizations of their service allies, a daunting challenge for the limited staffs of the smaller firms. Failure to give thorough training to the support staffs of the partnering companies can lead to ineffective service. Poorly conceived procedures for responding to customer calls, dispatching field personnel and ensuring the availability of parts can create serious problems for users.

These arrangements can also limit the amount of direct feedback the manufacturer gets from its customers. By using a third party to support its users, the manufacturer no longer has direct contact with them and may not be able to react quickly to their complaints because it takes longer for these problems to reach the appropriate ears.

Given these potential problems, you should evaluate these service arrangements carefully. If a product manufacturer is using a strategic partner to support its products, find out the specific procedures that have been put into place to ensure a rapid response to your calls. Ask questions about the extent of the training being given to the service provider's staff. And seek reference accounts in your geographic area to see how well the service agreement is working in your neighborhood.

As vendors find it harder to differentiate themselves on the basis of their products alone, many are attempting to use their direct or indirect service capabilities as a new means of standing out from the crowd. Rather than recognizing the real investment necessary to make these new service alliances a success, some vendors are rushing into as many agreements as possible to improve their competitive position in the market.

The result can be poor service quality and lots of problems for users who didn't investigate these issues before selecting their networking vendors.

Kaplan is director of the service industry research programs at The Ledgeway Group, a Lexington, Mass.-based subsidiary of Dataquest.

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EDITORIAL

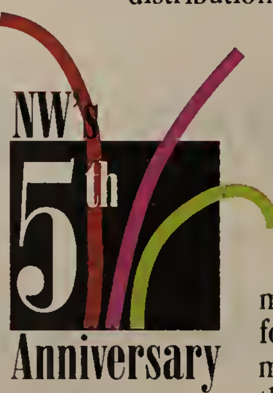
Network World celebrates five years of serving users

Five years isn't terribly old as newspapers go. The *Times* of London celebrated its 200th birthday in 1985. *The New York Times* will be 140 this year.

This issue marks our fifth anniversary. In the great scheme of things, five years is but a blink of an eye. Still, in the past five years, we have recorded dramatic changes in the net arena. And over the course of our 250 or so issues, we have chronicled the growing importance of networks to corporate America and the increasing stature of net executives.

To look back at *Network World's* first issue — published on Monday, March 24, 1986 — is to be reminded of just how sweeping the transformation of networking has been.

The first issue had little coverage of local-area networks — and not because of editorial oversight. It was simply because LANs were just beginning to reshape the information systems landscape. Now they have become platforms for critical business applications and are increasingly relied on as the local distribution channel for corporate data backbones.



Another change has occurred over the past five years. In 1986, nets were generally considered mere transmission paths for information, which meant that they were the servants of computers. Today, the nets themselves are viewed as the corporate information resource and increasingly are the foundation for building strategic applications. Now networks are the real information system.

One thing that has not changed over the years is *Network World's* mission to serve the network user. We stated that in our first editorial; we state it again today. Our mission — to be the most important source of news and analysis for the executives who design, build and manage enterprise networks — has not changed. And it will not.

For all of you who have helped us over the years with your advice, comments, and — yes — your patience, all we can say is thanks. All we can *do* is continue our commitment to serving network users.

Networking will always be changing, and we will change with it. Five years from today, when net technologies and problems will, most likely, be on a higher plane, we'll be around, reporting, probing, commenting, analyzing and serving the networking community.

OPINIONS

MACROSCOPE

BY JAMES KOBIELUS

Groupware: In search of a new metaphor

Groupware vendors are having trouble explaining to users — and, seemingly, to themselves — what purpose their products serve and how they differ from other network applications. Groupware is still too vague a notion to incite the popular imagination.

From a product development standpoint, a clear metaphor such as the desktop analogy, which is used so successfully by graphical user interface companies, will help groupware companies bring cohesion to their products.

Perhaps the most appropriate metaphor for groupware is the analogy between human work groups and parallel processing.

By putting many heads and hands on a task, groups can complete it in less time than could one member working alone. Likewise, concurrent processing by many computer nodes can radically reduce execution time on big, complex jobs.

Human productivity in groupware environments depends on how well the two main concerns in parallel system architecture — interprocessor coordination and communications — are addressed by application developers.

In any work environment, interpersonal coordination is made possible through such elements as agendas, goals, plans, schedules, milestones, assignments, budgets, commitments, routing lists, access privileges and standards. The most effective control on group behavior may be the ability of individuals to interrupt and redirect one another's efforts.

Unfortunately, few groupware environments provide strong coordination features. At most, they provide shared schedules and calendars that users can easily ignore.

Vendors seem reluctant to give their environments more "teeth" — such as action items that beep until they are addressed by the user — for fear that they would be regarded as too intrusive.

But groupware that is oriented toward coordinating individual efforts need not be overbearing. Rather, the system could enable users to create the control structures that are best suited to their group work styles, instead of imposing a single modus operandi on all work groups.

> Few groupware environments provide strong coordination features.
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The core of such an environment could be a multiuser project management and tracking system, which would give work groups the flexibility to define complete task-oriented environments for various projects and activities.

The system would give participants project-specific roles in various ways — for example, by maintaining a master project schedule, reminding participants of overdue assignments, controlling access to shared files, requiring use of particular reporting and correspondence formats, and transmitting documents according to a prespecified routing list.

Depending on the corporate culture, the right to interrupt other users with urgent screen-displayed beeping messages could either be limited to managers or spread around more democratically. High-coordination groupware would allow users to reset these and other control parameters as group structure and preferences evolve.

The other major concern in groupware design is interpersonal communication, the area in which many current groupware offerings are strongest. The best groupware systems recognize that human work groups, like parallel processing systems, rely on two principal forms of communication: shared memory and message passing.

In groupware environments, the role of shared memory is played by shared file and data base management systems, such as Lotus Development Corp.'s Lotus Notes, while message passing is supported principally by electronic mail.

The most brilliant feature of Notes is its integration of data base, file and message management.

Any E-mail message within Notes can be placed in a common file, and any file or data base view can be sent as part of a person-to-person compound message. All messages are potential files, and all files are potential messages.

This integrated information structure could capture the sum total of activity on a particular project, especially if it were upgraded to support the full range of multimedia communications.

Moreover, an information structure such as this could be the feature common to both high-coordination and high-communications groupware.

The fundamental coordination mechanism in most organizations is the portfolio of customized data applications — for example, order entry, financial analysis and inventory management — that implement corporate processes and procedures.

A user-friendly, customizable DBMS would be the means by which users could create their shared working environment.

Kobielus, a contributing editor to Network World, *is a telecommunications analyst with Fairfax, Va.-based Network Management, Inc., one of the largest local-area and wide-area network systems integrators in the U.S.*

TELETOONS

BY FRANK AND TROISE

Now wait a minute!! On Tuesdays you compress the data and I transmit it.

LETTERS

Beware of empty promises

Your recent discussions of virtual and artificial reality ("Network Innovators," *NW,* Feb. 4 and "Virtual reality may transform future multimedia interfaces," *NW,* Feb. 25) hint at promises of a much richer computing environment, but readers should be cautious. I remember the early promises and predictions of artificial intelligence researchers in the 1960s.

I also recall the prognostications of voice recognition researchers in the early 1970s. In 1980, I thought voice recognition would surely become a mainstream technology by 1985.

All these glories *will* happen. However, we shouldn't ignore two all-important considerations: inertia and the human factor. We in the U.S. seem tied to the "Old West's gunslinger" mentality that has given us some fast-growing (and also fast-eroding) markets and companies. The Europeans often laugh at us for discarding one generation of technology before we've used even 5% of its potential.

I am as guilty as any when it comes to being enthralled by the latest technology. I only hope that our current overexpectations of virtual reality don't lead to its untimely demise.

John Neubert
Director of academic computing
Drew University
Madison, N.J.

Money's no solution

I'm writing regarding your editorial "It's time to put cash to work in allocating frequencies" (*NW,* Feb. 11). In my opinion, market forces would

(continued on page 36)

Network World *welcomes letters from its readers.*

Letters should be typed and double-spaced. Mail them to Editor, Network World, *161 Worcester Road, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

LIKE ALLIGATORS IN A SWAMP, unforeseen problems can really put the bite on a communications operation. Many managers find themselves wrestling with these networking reptiles every day.

If you've survived an "alligator attack," share it with our readers by calling Susan Collins, assistant features editor, at (508) 820-7413 or fax your idea to us at (508) 820-3467. Alligators should be 1,200 words in length and submitted either on disk or via modem.

DATACOM

BUYER'S GUIDE

ELECTRONIC MAIL SOFTWARE AND SERVICES

E-mail services grow up

CONTINUED FROM PAGE 1

service was available only through a few value-added networks. By 1986, AT&T, IBM, MCI Communications Corp. and others had also entered the market.

Langner is an associate of TeleChoice, Inc., a Montclair, N.J., telecommunications consultancy specializing in long-distance service analysis and network design. He can be reached at (201) 746-0200.

According to research by TeleChoice, Inc., six suppliers of E-mail services dominate the market: AT&T, with AT&T Mail and EasyLink Mail; BT Tymnet, Inc., which offers Dialcom; GE Information Services, with its QuikComm product; IBM, which offers Expedite/MAIL and ScreenMail; MCI, which provides MCI Mail; and US Sprint, which offers SprintMail.

Dozens of other messaging service providers offer various levels and types of services. CompuServe, Inc. of Columbus, Ohio, Graphnet, Inc. of Teaneck, N.J., and Syscom, Inc. of San Jose, Calif., all offer services competitive with the top six suppliers. An international competitor is Network Innovations PTY; Ltd. of North Sydney, Australia.

The X.400 trend

A single gateway to all electronic services, in which voice messages, faxes, E-mail and telexes can be stored and accessed at a later date, is one major goal that electronic messaging vendors are currently seeking. An older goal, universal interconnectivity of E-mail services, is now close to fulfillment.

The E-mail service vendors began installing X.400-based interconnections a few years ago. Now most major vendors — and quite a few of the minor ones — are directly linked to one another.

With basic X.400 connectivity

in place, the focus now is on upgrading the version of X.400 that is being used. Virtually every X.400 gateway in use today is based on the 1984 version of the CCITT X.400 specification.

The 1988 revisions to those X.400 recommendations added several important new features to X.400, and now every major service provider is planning to roll out services and features that are based on the 1988 X.400 document.

Service providers see this not only as an opportunity for providing a service, but as a base for developing X.25 dial-up access to the rapidly increasing number of local-area network-based E-mail systems.

Sizing up the competition

Information comparing the various service providers is shown in the accompanying chart. Some of the important details are:

■ **Computer systems supported.** Most E-mail services are designed for use with a wide variety of computer systems. Some, such as BT Tymnet or the OTC Dialcom service from Network Innovations, can be accessed through any computer linked to a public X.25 packet network. A few vendors, including CompuServe and Syscom, designed their services specifically for use with desktop computer systems.

CHART • GUIDE

A Buyer's Guide chart comparing several electronic mail software packages and services appears on pages 32 and 33.

■ **Interconnection to other E-mail services.** Many user organizations prefer to standardize on one major E-mail service for corporatewide use. That's fine for in-house use. But users in organizations of any size will at least occasionally need to transmit messages or trade information with other user organizations employing different E-mail services.

■ **LAN/office system support.** This is a key concern for users planning to utilize an E-mail service to link different sites with different computer systems. Some users are also concerned about the type of file-transfer capability offered by the E-mail service. Some offer little more than basic ASCII text transfer; others, such as AT&T, MCI and US Sprint, allow users to transmit a wider range of data, including informa-

(continued on page 33)

E-mail providers now offer a wide variety of services, including file transfer, single- and broadcast fax, and links to voice messaging.

NETWORK WORLD

E-mail software and service providers (continued on page 33)

Company	Service	Computers supported	Interconnection to other E-mail services	LAN/office system supported	Basic services	Gateway services	Conversion to E-mail offered	Fax capabilities	Access supported	Message delivery options	International delivery	File transfer options	Letterhead/custom forms setup available
AT&T EasyLink Services **Basking Ridge, N.J.** **(800) 367-7225**	AT&T Mail/ AT&T EasyLink Mail	Personal computers: MS/DOS-based, Apple Computer, Inc. Macintosh; minicomputers: Unix, Digital Equipment Corp., IBM, Wang Laboratories, Inc., Data General Corp.; mainframes: IBM, DEC	AT&T EasyLink, AT&T Mail, MCI Communications Corp. MCI Mail, US Sprint Communications Co. SprintMail, BT Tymnet, Inc. DialCom Mail 400, GEIS QuikComm, IBM ScreenMail	3Com Corp. 3+ Mail, Novell, Inc. NetWare, cc:Mail, Inc. cc:Mail LAN, IBM PROFS or DISOSS, IBM Application System/400, DEC All-in-1, Wang Office, Unix	E-mail, X.400 messaging, fax, surface mail, Telex, mailgram, message store and forward (dial-out only), BBS access, courier delivery of messages, voice retrieval of messages	BBS services, AT&T InfoMaster, AT&T Executive Briefing Service	Telex	Multiple simultaneous faxes, time limit on delivery, delivery confirmation or cancellation notice/date, time, number of tries	Asynchronous modem dial-up via 800 number and local telephone number, direct link (via FEP, dedicated line, others), bisynchronous dial-in/out, bisynchronous dedicated link, SNA batch dial-in/out	On-line; hard copy via standard surface mail, Federal Express, Express Mail, Telex, mailgram, fax, others	On-line: 102 countries via packet connections; hard copy: any postal address worldwide, links with overseas E-mail services	ASCII, EBCDIC, EDI	Yes
BT Tymnet, Inc. **San Jose, Calif.** **(800) 435-7342**	Dialcom	Any computer using dial-up asynchronous or X.25	AT&T Mail, AT&T EasyLink, IBM ScreenMail, MCI Mail, SprintMail, GEIS, British Telecom Gold 400	Supports LAN E-mail connections via Touch Communications, Inc. software	E-mail, X.400 messaging, fax, Telex, mailgram, BBS access	Bureau of National Affairs' BNA On-Line, Bibliographic Research Services, Dow Jones News/Retrieval, Global Reports, OAG, SABRE, BT Tymnet internal news data base	Telex	Automatic retry, delivery confirmation or cancellation notice	Local dial-up, 800 dial-up, dial-up X.25, direct link (via FEP, dedicated line, other), international local access via BT Tymnet Global Network Services and TymUSA	On-line, Telex, mailgram, fax, cablegram	On-line: more than 90 countries; hard copy: Telex, fax	ASCII, expanded hexadecimal, EDI	No
CompuServe, Inc. **Columbus, Ohio** **(800) 848-8199**	CompuServe	IBM and compatible personal computers; Apple Macintosh; any computer using compatible terminal-emulation software	MCI Mail, Internet	3Com 3+ Mail, Novell NetWare, cc:Mail LAN	E-mail, fax, surface mail, Telex, message store and forward, BBS access	Gateways to all 1,400 CompuServe on-line services	Telex	Multiple simultaneous faxes, delivery confirmation or cancellation notice/date, time, number of tries	Asynchronous modem dial-up via local telephone number on CompuServe network	On-line; hard copy via standard surface mail, Telex, fax	On-line to any country; hard copy to any country	ASCII	No
GE Information Services **Rockville, Md.** **(301) 340-4000**	QuikComm	Personal Computers: IBM PC/AT, XT, OS/2; minicomputers: Unix, DEC, IBM, Wang; mainframes: IBM, DEC, NCR Corp., Unisys Corp., Bull HN Information Systems, Inc., others	AT&T EasyLink, AT&T Mail, MCI Mail, BT Tymnet Dialcom	3Com 3+ Mail, cc:Mail LAN, IBM PROFS or DISOSS, IBM AS/400 Office and System 3/X, any LAN using MHS, Consumers Software, Inc. Network Courier LAN, DEC All-in-1, Wang Office	E-mail, X.400 messaging, fax, surface mail, Telex, mailgram, message store and forward, BBS access (via GEIS GEnie), news clipping services	Dow Jones News/Retrieval, GEnie, BBS services, other information services/data bases via GEnie	Fax, surface mail, Telex	Multiple simultaneous faxes, time limit on delivery, delivery confirmation or cancellation notice/date, time, number of tries	Asynchronous modem dial-up via 800 number, direct link (via FEP, dedicated line, other)	On-line; hard copy via Telex, mailgram, fax	On-line; hard copy via Telex, mailgram, fax; links with overseas mail services	ASCII, EDI, binary	Yes
Graphnet, Inc. **Teaneck, N.J.** **(201) 837-5100**	Graphnet Electronic Mail	Personal computers: IBM PC/AT, XT, OS/2; minicomputers: Unix, DEC, IBM, Wang, NCR, others; mainframes: IBM, DEC, NCR, Unisys, Bull HN Information Systems, others	AT&T Easylink, AT&T Mail	3Com 3+ Mail, Novell NetWare, cc:Mail LAN, IBM PROFS	E-mail, X.400 messaging, fax, surface mail, Telex, mailgram, message store and forward, BBS access	Delphi Information Systems, Inc.'s Delphi	Fax, surface mail, Telex	Multiple simultaneous faxes, user-selectable number of retries, time limit on delivery, delivery confirmation or cancellation notice/date, time, number of tries	Asynchronous modem dial-up via 800 number and local telephone number, direct link (via FEP, dedicated line, other)	On-line; hard copy via standard surface mail, Federal Express, Express Mail, Telex, mailgram, fax	On-line to any country; hard copy via standard surface mail, Federal Express, Express Mail, Telex, mailgram, fax to any country	ASCII, EBCDIC, EDI, others	Yes
IBM Information Network **Tampa, Fla.** **Contact local IBM office**	IBM Mail Exchange	All IBM Office (E-mail) systems, plus IBM compatibles (contingent on interoperability testing)	AT&T EasyLink, AT&T Mail, MCI Mail, SprintMail, BT Tymnet DialCom Mail 400, QuikComm, GEnie, Netherlands PTT Memocom-400 Network	IBM PROFS, DISOSS, OfficeVision, CMS, TSO, IBM Information Exchange, IBM-compatible systems (contingent on interoperability testing)	E-mail, X.400 messaging, fax (via third-party provider), Telex (via third-party provider), BBS access (via custom offering)	IBM Information Exchange (EDI services)	Fax and Telex (both via third-party provider)	Multiple, simultaneous faxes, time limit on delivery, delivery confirmation or cancellation notice/date, time, number of tries	Asynchronous BSC/SDLC modem dial-up via 800 number or local telephone number, direct link (via SNA, X.25)	On-line; hard copy via third-party service provider	On-line: any country with SNA/X.25 connection capability; hard copy: via third-party service provider	ASCII, EBCDIC, EDI	No
Infonet Services Corp. **El Segundo, Calif.** **(213) 335-2875**	Notice	Any IBM and compatible personal computer	AT&T Mail, MCI Mail, Keylink (Australia)	3Com 3+ Mail, Consumers Software Network Courier, Novell NetWare, cc:Mail LAN, DEC All-in-1, IBM PROFS or DISOSS, Wang Office	E-mail, X.400 messaging, fax, Telex, message store and forward	CompuServe, Minitel (France), BTX Services (Germany)	Telex	Multiple simultaneous faxes, user-selectable number of retries, time limit on delivery, delivery confirmation or cancellation notice/date, time, number of tries, optional cover page	Asynchronous modem dial-up via local telephone number, direct link via dedicated line, X.25 dial-up	On-line; hard copy via Telex, fax	On-line worldwide; links with overseas mail services (France, Germany, Australia), most PTTs	ASCII	Yes

BBS = Bulletin board system
CEO = Comprehensive Electronic Office
CMS = Conversational Monitor System
FEP = Front-end processor
GEIS = GE Information Services
MHS = Novell's Message Handling System
NA = Not applicable
OAG = Official Airlines Guide

This chart includes a representative selection of electronic mail software and service providers. Other vendors not included may offer competitive products.

SOURCE: TELECHOICE INC., MONTCLAIR, N.J.

NETWORK WORLD

E-mail software and service providers (continued from page 32)

Company	Service	Computers supported	Interconnection to other E-mail services	LAN/office system supported	Basic services	Gateway services	Conversion to E-mail offered	Fax capabilities	Access supported	Message delivery options	International delivery	File transfer options	Letterhead/ custom forms setup available
MCI Communications Corp. Washington, D.C. (800) 444-6245	MCI Mail	Any hardware transmitting ASCII; special link software available for DEC, Hewlett-Packard Co., IBM and Wang systems	AT&T Mail, British Telecom Gold 400, CompuServe, BT Tymnet Dialcom, AT&T EasyLink, GEIS, IBM Information Network, Infonet, SprintMail, connections to 21 services worldwide	3Com 3+ Mail, Banyan Systems, Inc. Banyan Mail, Microsoft Corp. Microsoft Mail, Network Courier, Novell NetWare, cc:Mail LAN, WordPerfect Office 3.0, any LAN using MHS	E-mail, X.400 messaging, fax, postal and courier service delivery, Telex, mailgram, BBS access	Dow Jones News/Retrieval	Telex	Multiple, simultaneous faxes, user-selectable number of retries, time limit on delivery, delivery confirmation or cancellation notice/date, time, number of tries, optional cover page	Asynchronous modem dial-up via 800 number and local telephone number, BT Tymnet value-added network, X.25 packet networks	On-line; hard copy: standard surface mail, worldwide courier service delivery, Telex, fax	On-line, surface mail and courier delivery worldwide, fax to any country accessible via International Direct Dial	ASCII, EDI, binary file transfer via MCI Mail Link software	Yes
Network Innovations PTY, Ltd. North Sydney, Australia (612) 954-3055	OTC Dialcom (public mailbox service)/ Connect-400 (X.400 mail service)	Any computer system accessible via X.25 public data network	AT&T Mail, MCI Mail, BT Tymnet, British Telecom Gold 400	Any supporting X.400 gateway	E-mail, X.400 messaging, fax (ASCIIa, only), Telex, message store and forward, proprietary file transfer	OAG, BT Tymnet news services, Australian Securities Commission, other information services/data bases through private subscription	Telex	Multiple simultaneous faxes, multiple retries, delivery confirmation or cancellation notice/date, time, number of tries	Public X.25 packet data network, dedicated access available	On-line; hard copy via Telex and fax	On-line to any Dialcom location; hard copy via Telex and fax to any location; any X.400 location	Dialcom: ASCII; Connect-400: no constraints	Custom forms available
Syscom, Inc. San Jose, Calif. (408) 432-8153	Syscom Message Service	IBM PC/AT, XT	AT&T EasyLink, AT&T Mail, MCI Mail, SprintMail	None	E-mail, fax, surface mail, Telex, mailgram, message store and forward	None	Fax, surface mail, Telex	Multiple, simultaneous faxes, user-selectable number of retries, time limit on delivery, delivery confirmation or cancellation notice/date, time, number of tries	Asynchronous modem dial-up via 800 number and local telephone number, direct link (via FEP, dedicated line, other), dial-up using proprietary error checking code protocol	On-line; hard copy via standard surface mail, Federal Express, Express Mail, Telex, mailgram, fax	On-line to any country	ASCII	Yes, for broadcast messages
Sprint International/ US Sprint Communications Co. Reston, Va. (800) 736-1130	Sprint-Mail (formerly TeleMail)	Personal computers: IBM Personal Computers and compatibles, Macintosh; minicomputers: Unix, DEC, IBM, Wang, NCR, HP, DG, Sun, Xerox Corp., Convergent Technologies, Inc.; mainframes: IBM, DEC, NCR, Unisys, Bull, other	Internet, AT&T EasyLink, AT&T Mail, MCI Mail, BT Tymnet, GEIS, BellSouth Corp.	3Com 3+ Mail, Novell NetWare, cc:Mail LAN, IBM PROFS, DISOSS and OfficeVision, DEC All-in-1, Wang Office, Banyan Mail, Data General Corp.'s CEO, Retix Mail, any private E-mail system derived from Ungermann-Bass, Inc., Soft*Switch, Inc. Soft*Switch, Consumers Software Network Courier, HP DeskManager	E-mail, X.400 messaging, fax, surface mail, Telex, mailgram, cablegram, BBS access, file transfer	Dow Jones News/ Retrieval, OAG, Newsgrid, private data bases	Telex	Multiple, simultaneous faxes, user-selectable number of retries, delivery confirmation or cancellation notice/date, time, number of tries, user formatting, stored graphics, user logo/ letterhead	Asynchronous modem dial-up via 800 number and local telephone number, X.25 public packet network, IBM 3780, SNA Distribution Services	On-line; hard copy via standard surface mail, certified mail, Telex, mailgram, fax, cablegram, forced delivery to printer	On-line via X.25 to 175 countries; E-mail links to major countries and systems	Any digital information via Xmodem, Ymodem or Kermit	Yes

BBS = Bulletin board system
CEO = Comprehensive Electronic Office
CMS = Conversational Monitor System
FEP = Front-end processor
GEIS = GE Information Services
MHS = Novell's Message Handling System
NA = Not applicable
OAG = Official Airlines Guide

This chart includes a representative selection of electronic mail software and service providers. Other vendors not included may offer competitive products.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

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tion in EDI format. This is especially helpful for users conducting business with other organizations using EDI or other file-transfer protocols.

■ **Basic services.** This is the most basic of comparison criteria, and users will find little difference between the offerings of the major E-mail service providers. As yet, none of the vendors listed provides any sort of voice mail capability or voice mail annotation to E-mail services. Most are examining such capabilities but are taking a wait-and-see attitude toward user demand and the price of the technology.

Today, user demand for such service is slight but could grow if the service providers make it available at attractive prices.

■ **Gateway services.** The top three interexchange carriers — AT&T, MCI and US Sprint — all offer users bulletin board services within their E-mail services; they also offer connection via their E-mail services to bulletin boards and on-line services.

> As yet, none of the vendors provides any sort of voice mail capability or voice mail annotation to E-mail services. Most are examining such capabilities but are taking a wait-and-see attitude toward user demand and price.
>
> ▲▲▲

All of the providers listed in the chart offer some sort of gateway service — usually at extra cost — to various on-line information services such as the Dow Jones News/Retrieval service. Of them all, CompuServe's seems to be the most limited; the service allows access only to CompuServe's on-line services — which, admittedly, are rather extensive.

■ **Conversion to E-mail.** Two of the major E-mail service providers — AT&T and BT Tymnet — offer only conversion from telex messages to on-line E-mail. GEIS, Graphnet, MCI, Network Innovations and US Sprint offer conversion from fax, surface mail and telex into on-line messages.

■ **Fax capability offered.** Every E-mail service listed in the chart provides at least basic E-mail-to-fax conversion, allowing users to send faxes anywhere worldwide through their E-mail service. Beyond this basic capability, most offer multiple simultaneous transmission — known as broadcast transmission — of fax messages to multiple destinations. This is an extremely handy service, especially for users whose own fax machines lack such capabilities.

Prices for fax transmission via E-mail services average 55 cents for the first half-page (not including cover sheets, which are typically sent at no charge) and about

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45 cents per half-page after that. Some services, such as AT&T Mail, MCI Mail and SprintMail, allow the user to send customized forms or even letterhead facsimiles with their fax messages at an additional cost.

- **Access supported.** All of the providers listed offer both a local telephone number and an 800 number; AT&T, Graphnet, Network Innovations and US Sprint offer direct links to customer computer systems or access via X.25 public packet networks.
- **Message delivery options.** Each of the providers listed offers some sort of alternate delivery method for transmitted E-mail — for example, fax, telex, cablegrams and surface mail — in addition to standard on-line messaging.

Also, most providers allow users to print messages directly from the screen, either document by document or in a continuous stream.

- **International delivery.** International delivery depends on two factors: whether the service provider has a service node in a country and the types of links the provider offers with overseas services. Most providers offer either on-line or postal delivery worldwide. Any provider offering telex-to-E-mail conversion allows telex transmission from any country with telex service to the U.S. or to any other location served by the provider.
- **File-transfer options.** Again, most providers offer a basic service that involves transmitting only ASCII text; a few, including CompuServe, Graphnet and US Sprint, also provide EDI, binary file or other file-transfer capability.
- **Letterhead/custom forms.** This is usually a function of the fax capability of an E-mail service. All the major providers, such as AT&T, MCI and US Sprint, offer such a capability with their fax services.

Pricing

Prices were omitted from the chart because every service provider prices its services differently.

For example, Graphnet charges a flat monthly fee of $25 for all its services, and CompuServe charges hourly for services. MCI Mail charges an annual fee, plus hourly charges, for information services; half-page charges for fax; and per-message charges for straight electronic messages. Message rates for other services, such as OTC Dialcom, vary by the number of kilocharacters sent or received, with a monthly minimum charge of $500 per corporate account.

How to make sense of it all? Figure out what you need for services and then call a customer service representative from each provider. Contact numbers are listed in the accompanying chart.

A few suppliers of LAN- or workstation-based E-mail, such as Apple Computer, Inc. and NeXT Computer, Inc., are working on some sort of voice annotation of E-mail or already have it available commercially.

These systems allow users to speak into a microphone, either externally (such as a telephone linked to the workstation) or built into the workstation, and offer comments, explanations or other information they couldn't or wouldn't put into text.

NeXT has an interesting internal system that allows users to add almost any kind of sound to an E-mail message. NeXT engineers like to tout the system's efficacy in getting the attention of message recipients. A user on the network sees the message indicator flashing, touches a button on the keyboard or mouse and may hear, "Hey! Read this now!" to the accompaniment of Beethoven's "Fifth Symphony" or the sound of trumpets.

As noted earlier, none of the E-mail service providers listed of-

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E-mail strategies of the major providers

While all of the major electronic messaging services are essentially alike in terms of features and linkage to external information services, each of the providers is pursuing its own strategy to enhance its market position.

Here's a rundown on what the top six providers are planning.

AT&T's strategy

AT&T is planning on integrating its varied electronic messaging systems into one aggregate offering. Its plans call for the integration of facsimile, voice mail, electronic mail and other forms of messaging that AT&T offers into what it calls a Universal Mailbox.

This gateway would be accessible by any user, either directly through a computer service (personal computer- or host-based) or indirectly through a voice interface for users who are traveling.

Users would be able to retrieve voice mail, access information on other computers, or send or receive faxes — all through the same service.

AT&T's acquisition of assets from Western Union Corp.'s former Business Services group, which was finalized in January, strengthened AT&T's position in this market.

The carrier's messaging business is now called EasyLink (Western Union's E-mail brand name). However, AT&T expects the final integration of EasyLink and AT&T Mail to take about two years.

BT Tymnet's strategy

Like AT&T, BT Tymnet, Inc. wants to integrate its various services into one on-line service.

A different thrust is BT Tymnet's ambition to expand its interconnections with third-party on-line data base services in an attempt to broaden its customer base.

In recent months, BT Tymnet has moved quickly to increase its interconnectivity. The company already has X.400 links with AT&T Mail and MCI Communications Corp.'s MCI Mail. This January, it announced new interconnection agreements with IBM Mail and US Sprint Communications Co.'s SprintMail and plans to link to AT&T's EasyLink service and GE Information Services' (GEIS) Quik-Comm service.

BT Tymnet also offers electronic data interchange, point-of-sale transaction services and other messaging and protocol translation services through its Tymnet global network service.

The data base feature is distinctive. BT Tymnet calls it Cyclopean Gateway Service, and it provides menu-driven access to more than 850 data bases from 13 global information service providers, including vertically specialized data base services for financial, medical, legal and other professions.

BT Tymnet, Inc. wants to integrate its services into one on-line service.

GEIS' strategy

GEIS is working hard to broaden its customer base both domestically and internationally and to enhance its own service offerings with synergistic offerings from affiliated General Electric Co. companies and from third parties.

IBM is pinning a lot on the success of its new electronic mail service known as IBM Mail Exchange, which is scheduled for U.S. availability in the second quarter.

An example is the company's recent "Letters From Home" campaign, which allowed both GEnie subscribers and nonsubscribers in the U.S. with access to a personal computer and modem to send personal messages, free of charge, to friends and relatives serving in Operation Desert Storm.

Letters were sent electronically via GEnie over the GEIS network to GE's local telecommunications facilities in Saudi Arabia. There they were printed on computers supplied by GE Rents, a GE-affiliated company. The letters were then delivered to the U.S. Armed Forces Command for delivery to the troops.

Like the other major providers, GEIS offers interconnection to other major carriers and services.

Its ownership of the GEnie on-line service — comparable to CompuServe — places it in a favorable position relevant to user needs for on-line data bases and bulletin boards.

IBM's strategy

IBM is pinning a lot on the success of its new, enhanced electronic mail service known as IBM Mail Exchange, which is scheduled for U.S. availability in the second quarter of this year.

The service will feature an on-line trade directory and a link to IBM's EDI services, as well as links to IBM and compatible host computers and local-area networks. IBM Mail Exchange is also designed to upgrade the capabilities now provided by IBM Expedite/MAIL, IBM's domestic E-mail service, and IBM ScreenMail, IBM's international E-mail system.

Users will be able to access IBM Mail Exchange through the IBM Information Network global value-added network. IBM Mail Exchange is expected to link a host of office systems — specifically, IBM's OfficeVision (including OfficeVision/2 LAN), Professional Office System (PROFS) and DISOSS — with other IBM and non-IBM systems, whether within one company or between companies.

IBM Mail Exchange will support both IBM host and LAN interconnections, as well as most X.400-compatible messaging systems.

In September, IBM announced several X.400 interconnection agreements for IBM ScreenMail and IBM Mail Exchange. Under them, users served by AT&T, GEIS, MCI and US Sprint will be able to communicate with users of IBM ScreenMail and, when available, IBM Mail Exchange.

MCI's strategy

One important goal of MCI is the continued expansion of MCI Mail service internationally, especially through the establishment of X.400 interconnections with foreign post, telegraph and telephone administrations and other carriers.

In addition, MCI is working with users and third-party software developers to design and implement links to LAN-based E-mail and host-based E-mail systems such as IBM PROFS and Wang Laboratories, Inc.'s Office.

Along this same line, MCI is working with users and developers to design business applications for MCI Mail — for example, trading partner networks using MCI Mail to transmit trading information and EDI messages without relying on dial-up connections.

US Sprint's strategy

US Sprint's SprintMail, introduced in 1980, is one of the oldest electronic messaging services still available. SprintMail, according to the company, was designed specifically for intra- and intercompany business messaging for large corporations and government agencies.

US Sprint still pursues such accounts aggressively and counts Baxter Healthcare Corp., GTE Corp., the National Aeronautics and Space Administration and TRW, Inc. among its clients.

Like its competitors, US Sprint offers X.400-based interconnection with all other major services, as well as with on-line data base services. This is in keeping with the company's long-standing strategy of international expansion of services.

The company wants to expand its international X.400 service, especially as the basis for EDI messaging, as well as X.500-based directory services. In addition, US Sprint is licensing SprintMail/TeleMail messaging services to overseas PTTs.

— *Mark Langner*

I'M READY TO TAKE AN IMPORTANT STEP FORWARD.

Racal InterLan's Roll Call sounds like it could dramatically reduce the time we spend looking for network card problems.

☐ Please send me additional information on Roll Call, including how to get my FREE Ethernet card with my Roll Call purchase.*

☐ No thank you, I'll keep tracking down my network card problems the old fashioned way — by foot.

Name ____________________
Title ____________________
Company ____________________
Address ____________________
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E-mail services grow up

continued from page 34

fer such annotation to their E-mail services. This is, in many cases, due to a lack of technological capability at the user end and a lack of user interest in such services.

By far, the majority of E-mail service users access the services through desktop personal computers, most of which have some type of internal speaker that can be used to take advantage of such services. Unfortunately, most users also lack any sort of microphone or the needed software for recording and digitizing voice messages or comments.

With AT&T's EasyLink Mail, users can have their messages read to them by a synthesized, digitized voice. Such an option could be quite useful for vision-impaired users or those with other disabilities that may limit their use of computers or other E-mail access terminal equipment. It's also great for people on the road who would like to access their E-mail messages by phone.

All of the carrier-owned messaging services have some type of plan to add voice-messaging capability to their messaging services.

However, users shouldn't get their hopes up quite yet; the estimates given by the carriers regarding availability of such services range from very soon to within the next few years (see "E-mail strategies of the major providers," page 34).

The major carriers offering E-mail, fax and voice services — AT&T, MCI and US Sprint — are planning to integrate their various messaging services in the near future.

When that occurs, all of their service offerings — text messaging, fax, file transfer, gateway services to other on-line services and, in some cases, voice messaging — will be accessible through a single-user mailbox or similar point of access.

None of the service providers has announced firm dates for the introduction of such integrated services. However, the technology already exists, and with the top carriers working toward the same goal, users should see some integrated offerings within the next 18 to 24 months, if not sooner.

Most industry observers see continued growth in interconnectivity services — those that provide links between isolated user LAN-based or host-based E-mail systems, including domestically and overseas.

Technologically, the service providers are looking for solutions for a potential bandwidth crunch caused by the use of messaging systems for transmitting graphics, data base files and — in the not-too-distant future — digitized, full-motion video. Those services that are either owned by or affiliated with interexchange carriers have the best shot at avoiding this bandwidth crunch.

A final area of future growth is referred to by some service providers as intelligent user agents. The premise is this: As the use and importance of electronic messaging services increase, the type of system employed by users to access such services will increase in complexity and processing capability, or intelligence.

Most E-mail users access the services via personal computers.

▲▲▲

Users can look for expert system-driven mail access software that can be programmed to access, read and screen messages. Triggers can be programmed into this software so that certain messages received or sent may direct the user's computer system to take certain actions automatically, such as opening a file or initiating a transaction.

Growth and acceptance of such intelligent user agents will probably be driven by the service providers, most of which have the technical and monetary resources to develop the needed software and to design optimized solutions for individual user needs.

User demand for these and other next-generation electronic messaging services will follow the technical innovation curve set by the service providers.

This doesn't mean that users aren't involved in the determination of the types and quality of services offered by the providers. But it does suggest that users are willing, at least in this market, to let the vendors take the chances. ◼

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continued from page 29

engender the commercial rape of the radio spectrum and would have a serious impact on public safety. In addition, major manufacturers in the radio industry have failed to provide advanced, efficient, bandwidth-contending systems in all frequency ranges. This complex question will never be resolved by money or market forces.

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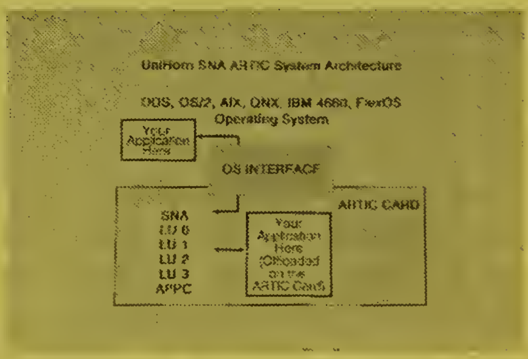
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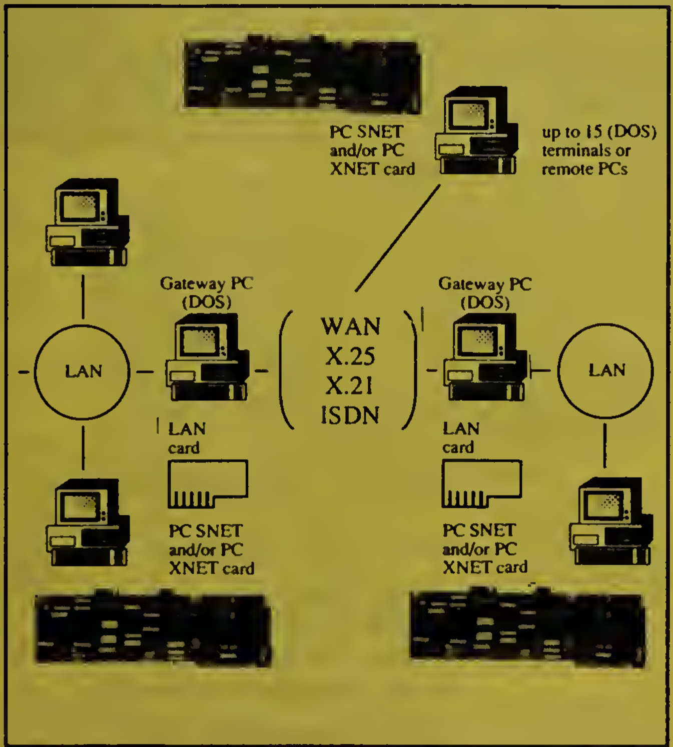
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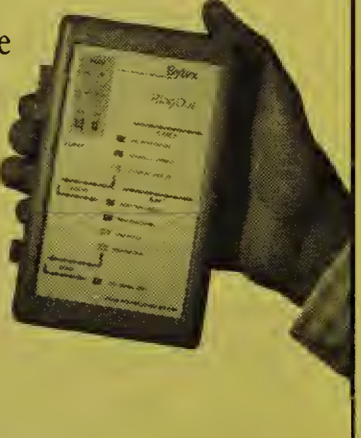

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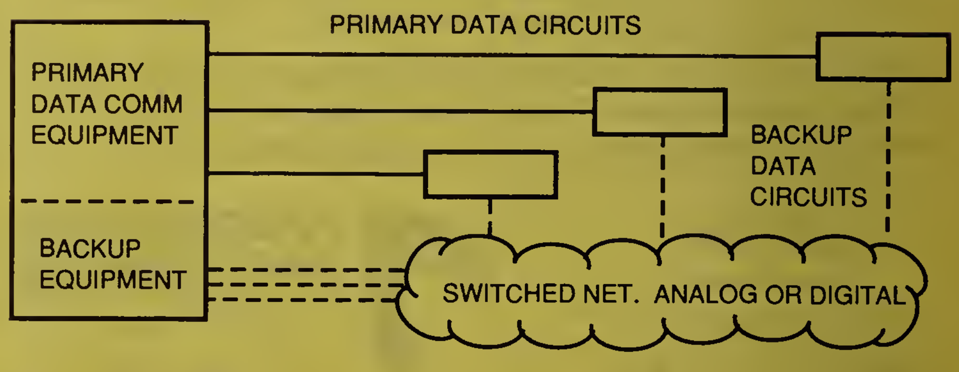

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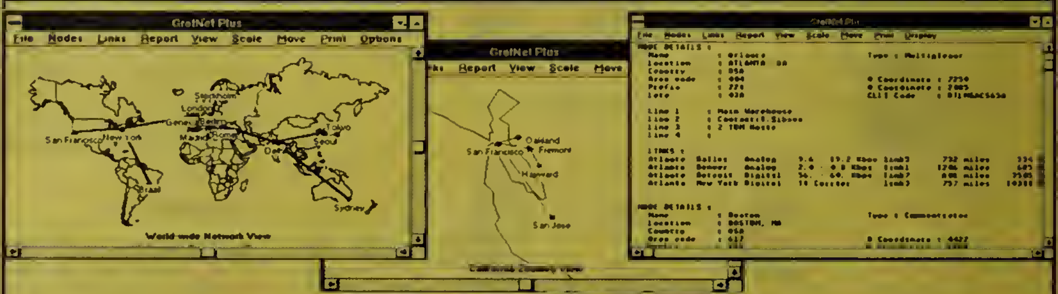

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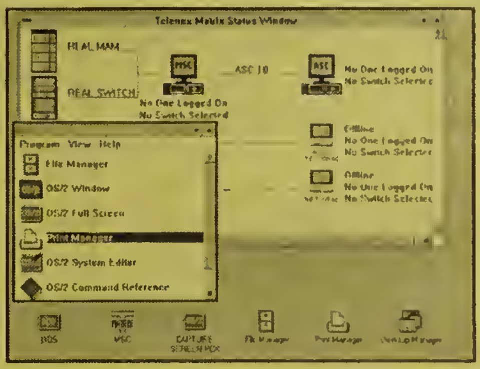

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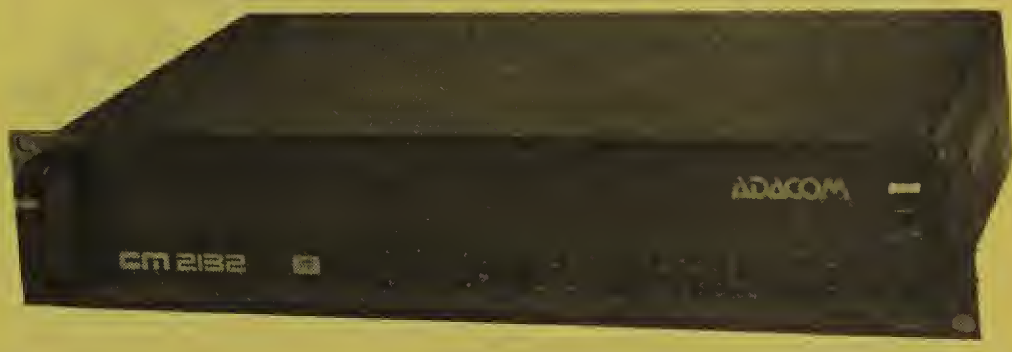

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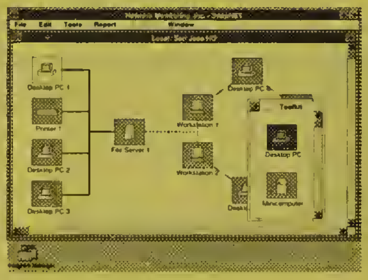

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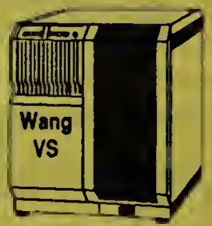

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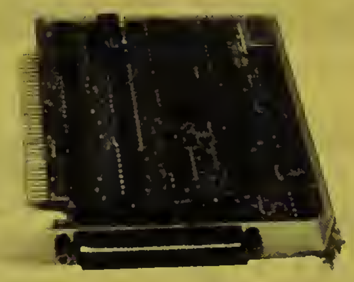

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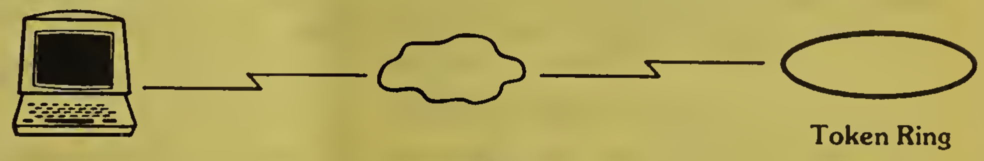

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All rates for listings are sold on a 26-week basis and are net priced for that period. A line listing is company name and telephone number.

Display listings are also available in four sizes. A display listing consists of copy of your choice.

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Space and copy closing for next updated issue is March 21. Listing begins in April 15 issue and runs through the October 7, 1991 issue.

For more information or the list of headings, call Eleni Brisbois, Resource Directory/Project Manager at 1-800-622-1108 or 508-875-6400.

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Listing runs through the November 11 issue.

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March 25
Buyer's Guide: Electronic mail software and services

April 1
Trends Reshaping Networks: EDI

April 8
Buyer's Guide: LAN operating systems

April 15
Standards update

April 22
Buyer's Guide: Interexchange carrier digital private-line services

April 29
Twisted-pair networks

May 6
Buyer's Guide: X.25 packet switches
Show Distribution: Dexpo South
Special: Harvey

May 13
Trends Reshaping Networks: Security
Show Distribution: GlobalNet
Special: Lead Service

May 20
Virtual networks update

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C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
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14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other ____________________

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporate Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other ____________________

3 What is the scope of your involvement in purchase decisions for Network/Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwave
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5 ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER ____________

9 What Is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07. ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09. ☐ NOVELL (NETWARE)
10. ☐ TOPS
11. ☐ PROTEON (PRONET)
12. ☐ OTHER ____________________

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ 10BASET
9. ☐ OTHER ________

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8. ☐ XENIX
9. ☐ PICK
0. ☐ OTHER ______

12 Please Indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently installed in your network.

B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am presently involved in the purchase process for the following products/services:

B) I plan to purchase the following products/services in the next 12 months:

Presently Involved A	Plan to Purchase B	LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	COMPUTERS/PERIPHERALS:
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11. ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14. ☐	☐	Printers
15. ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers

(continued on next column)

Presently Involved A	Plan to Purchase B	SOFTWARE:
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Software
23. ☐	☐	Applications Software
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
26. ☐	☐	E-Mail Software
A	B	DATA COMMUNICATIONS:
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packet Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Test Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adapter Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Software
A	B	TELECOMMUNICATIONS:
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	SERVICES:
53. ☐	☐	Switched Voice
54. ☐	☐	Dedicated Leased Line
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packet Switched
59. ☐	☐	Centrex
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

17 Estimated value of networking equipment and services:

A: Which you helped specify, recommend or approve in the last 12 months?

B: Which you plan to help specify, recommend or approve in the next 12 months?

A	B	
1 ☐	☐	$100 million and over
2 ☐	☐	$50 - $99.9 mill
3 ☐	☐	$25 - $49.9 mill
4 ☐	☐	$20 - $24.9 mill.
5 ☐	☐	$10 - $19.9 mill.
6 ☐	☐	$5 - $9.9 mill.
7 ☐	☐	$1 - $4.9 mill.
8 ☐	☐	$500,000 - $999,999
9 ☐	☐	Under $500,000

18 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bill.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rate Interface Terminal Adapters
2. ☐ Primary Rate Interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will y consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER ____________

NETWORK WORLD
The Newsweekly of Enterprise Networking Strategies
An IDG Publication

91NN

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Network World Readers . . . involved in the purchase

1. Establish networking/communications requirements for company or department.
2. Authorize or approve the purchase of networking or communications hardware, software or systems.
3. Integrate CPUs from multiple vendors into networked systems.
4. Personal involvement in the purchase of voice communications equipment, services or software.
5. Personal involvement in the purchase of local-area networks (including LAN operating systems).
6. Personal involvement in the purchase of bridges, routers gateways/wide-area networks.
7. Personal involvement in the purchase of private networks.

Network World Readers . . . use and plan to purchase

8. Single-department LANs currently in use at location.
9. Multi-department LANs currently in use at location.
10. Modems under 9600 BPS planned for purchase over the next 12 months.
11. Protocol converters planned for purchase over the next 12 months.
12. Wide-area networks currently in use at location.
13. Wide-area networks planned for purchase over the next 12 months (tied for first).
14. Bridges, routers or gateways planned for purchase over the next 12 months.
15. T-1 or T-3 networks currently in use at location.
16. Micro-mainframe emulation boards currently in use at location.

Network World Readers . . . largest companies, biggest budgets, power to spend

17. Personally involved in spending over $100K on voice communications systems in the past 12 months.
18. Can authorize expenditures in excess of $25K for computer, networking or communications equipment or software.
19. 10 or more internetworked sites in organization.
20. 1,000 or more employees in organization.
21. More than $1 billion in total company sales.
22. Management responsibility/networking or communications job function.

NETWORK WORLD

Because The Network Is Everything.

An IDG Publication

Novell offers NetWare hybrid

continued from page 1

than on the functions inherent in the different versions.

The new pricing should appeal to a number of users, especially those that previously used Advanced NetWare or SFT NetWare. Under Novell's old pricing plan, those users paid several times more for higher end versions than NetWare ELS — even if they only supported five users.

NetWare 2.2, however, offers full functionality in five-, 10-, 50- and 100-user versions.

Analysts said this could be a boon for smaller shops that previously used the ELS versions. These customers will be paying similar prices and getting additional features, such as disk mirroring, internetworking and OS/2 capabilities, previously available only on the more advanced versions.

Analysts were pleased with the new packaging. "This is a significant step for Novell," said Shirley Hunt, an analyst at Dataquest, Inc. in San Jose, Calif. "They've made it simpler to install, and the pricing is much more sensible."

> This could be a boon for smaller shops that previous used the ELS versions.
>
> ▲▲▲

NetWare made easy

According to users and analysts, the most significant enhancement is the simplified installation process. Ladd Timpson, product line manager for work group operating systems at Novell, said that, previously, local-area network administrators literally had to navigate their way through pop-up windows within NetWare 2.X, deciding which options to choose.

With NetWare 2.2, the installation screen appears as a work sheet, where the user simply fills in the blanks. "The end result is it takes less time," Timpson said.

Novell also redesigned file server memory to support considerably more File Service Processes, which the company said will improve server performance for customers supporting large numbers of client workstations, Value-Added Processes (VAP) or large disk subsystems.

NetWare Version 2.2 also includes the latest NetWare for Macintosh Version 2.2 VAPs. These provide support for Apple Computer, Inc. AppleTalk Phase 2 and AppleTalk Filing Protocol Version 2.0, as well as Apple's TokenTalk network interface, none of which were available with the previous lower end NetWare.

With the Macintosh support, AppleTalk users attached to the NetWare LAN can use native Macintosh protocols for sharing files with a NetWare server, instead of supporting Novell protocols.

At least one user, however, questioned whether NetWare Version 2.2 offers enough added value to keep users from jumping to 80386-based NetWare versions.

Edwin Wilk, network manager at WHDH-TV in Boston, said that while those 80286-based users satisfied with current versions of NetWare are not likely to upgrade, "I would think those that want to upgrade will move to [NetWare] 3.11."

Katherine Barrett, an analyst at Network Strategies, a consulting practice of Ernst & Young in Vienna, Va., was equally skeptical. Novell, she said, has hinted that it wants to move customers off the 80286-based platform to NetWare 3.11 running on 80386-based servers. Novell said it wants to kill off NetWare 2.X, "but this is certainly not killing it off," Barrett said.

Timpson denied some reports that NetWare Version 2.2 might be the last 80286-based release and stressed Novell will meet customer needs.

NetWare Version 2.2 is available now. The five-user version costs $895, the 10-user version costs $1,995, the 50-user version is priced $3,495, and the 100-user version sells for $5,495. ◻

THE BEST READ

MOST IMPORTANT

MOST USEFUL Networ

NETWORK WORLD
The Newsweekly of User Networking Strategies
Volume 7, Number 18 An International Data Group Publication April 30, 1990

U.S. to study Soderblom token patent
By Laura DiDio, Senior Editor
(continued on page 62)

What's in a name?
DEC's Distributed Name Service (DNS) process

DEC describes benefits of X.500 directory services
X.500 will extend DNS offering to incorporate non-DEC devices in DECnet Phase V directories.
(continued on page 59)

Microsoft to market LAN Manager direct
Software giant to sell NOS to Compaq resellers to stabilize LAN Manager camp, jump start sales.
By Laura DiDio, Senior Editor
(continued on page 6)

Fax facts

Net execs try to tame fax monster
By Tom Smith, New Products Editor
(continued on page 8)

NETLINE
▲▲▲
AT&T TRIDOM plans to trial a pan-European VSAT network with two users. Page 2
A TARIFF IS USER is the loser in a heated battle between MCI and AT&T. Page 2
VENDORS AIMING for FDDI interoperability form a testing consortium. Page 2
3COM ELECTS Benhamou to the post of president. Page 4
AMEX AWARDS MCI with a service contract that could be worth up to $100m. Page 4.
US SPRINT EXTENDS VPN services into international markets. Page 4
PRIVATIZING TELECOM in Eastern Europe is a question of capital. Page 43.

FEATURE
▲▲▲
Telecom privatization will aid int'l users
By Norman Lerner, Special to Network World
(continued on page 38)

The results are in and Network World is the clear leader. The 1990 Wall Street Journal/ICA Member Study is conducted among members of the prestigious International Communications Association (ICA), an organization whose representatives purchase $16 billion of information technology products and services each year.

Since Network World began in 1986, we've maintained a singular focus: to be the most useful source of information for users involved in multivendor, multisite enterprise networks and, in doing so, provide the most value for our advertisers.

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Firms unite for broadband

continued from page 2

plagued Integrated Services Digital Network.

Lack of compatibility between vendors' switches has been cited as one of the reasons ISDN deployment has fallen below expectations.

"You see vendors much more anxious to cooperate because of their experience with ISDN," said Irwin Dorros, vice-president of technology at Bellcore.

Joseph Colson, switching systems vice-president at AT&T Network Systems, agreed. "Switching manufacturers are working together from the beginning [on high-bandwidth technologies] instead of venturing forth on their own," he said.

Notably absent from the COMPASS collaboration is No. 2 switch maker Northern Telecom, Inc. Jerry Kerschner, program director for broadband services at US West, said the carrier has had discussions with Northern Telecom but Northern Telecom is focusing on frame relay instead of the technologies the group is pursuing. Kerschner said the switch maker might be included in later test phases.

The COMPASS project is expected to help vendors tailor high-bandwidth services around anticipated applications. Some industry observers have ridiculed ISDN as a technology in search of an application.

Kenneth Hovaldt, vice-president of sales and marketing with Fujitsu, agreed that the development of technologies based on anticipated applications is vital.

"Over the last few years, the industry has developed a deeper appreciation of the role that attractive applications play in the deployment of new technologies. [With trials such as COMPASS] broadband technology will not be slowed by a lack of applications," Hovaldt said.

The newly formed group has lined up six customers to participate in COMPASS: Northwest Airlines, the University of Minnesota, the state of Minnesota, the Minnesota Supercomputer Center, Health One Corp. and Moore Data Management Services, a Minneapolis real estate firm.

In one test, 28 US West executives in five states will use T-1 and T-3 lines and ISDN signaling to support a desktop videophone system. The first phase of the trial will test only video transmissions, but later phases will test multimedia and personal computer-based applications.

> The newly formed group has lined up six customers to participate in COMPASS.
>
> ▲▲▲

A second trial will test switched T-1 applications such as videoconferencing, computer-aided design and manufacturing transmissions, disaster recovery and network overflow.

A third trial will test medical imaging applications and local-area network interconnections over SMDS. The test will support Ethernet, token ring and Fiber Distributed Data Interface.

The fourth project will test supercomputer interconnection and multimedia applications using Asynchronous Transfer Mode technology.

Moore Data Services will test delivery of imaging information to a remote video real estate listing service using multiplexed ISDN Basic Rate Interface lines. The project will also look at medical applications such as the transmission of X rays.

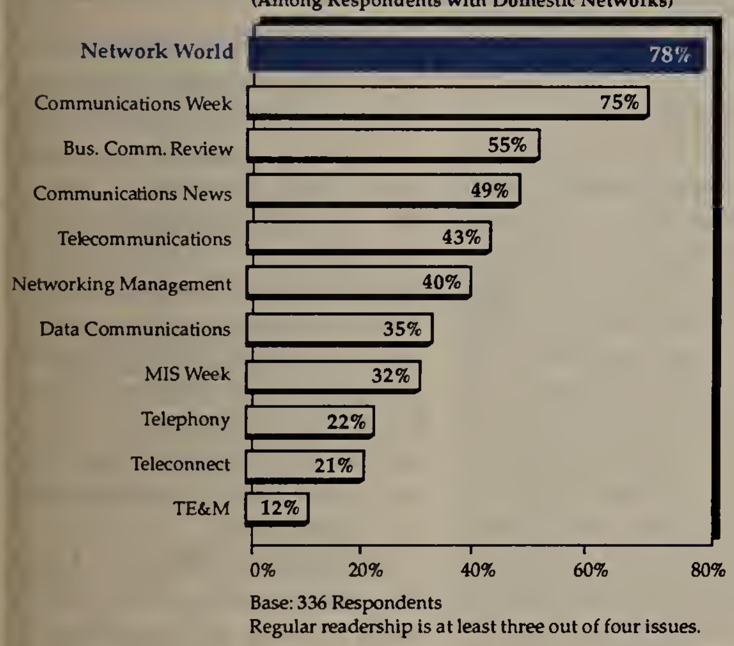
Each of the vendors participating in COMPASS will provide equipment and support for the project. AT&T Network Systems will supply a 5ESS switch, a Digital Access and Cross-Connect System IV-2000, Ethernet terminal adapters, application processors and long-distance services for interexchange applications.

Siemens Stromberg-Carlson will supply its EWSD switch, and Fujitsu will provide its FETEX 150 switch for the trials. ◘

ing Publication In America

Domestic Regular Readership

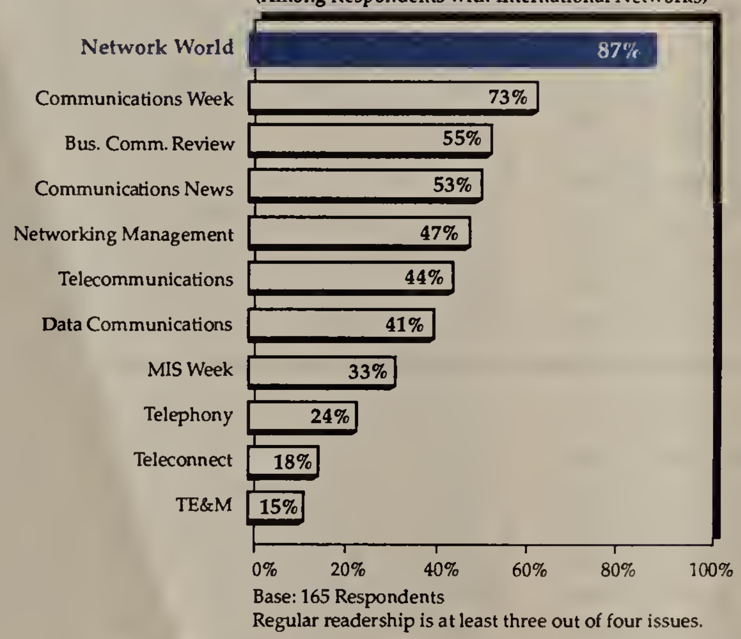
(Among Respondents with Domestic Networks)



Base: 336 Respondents
Regular readership is at least three out of four issues.

International Regular Readership

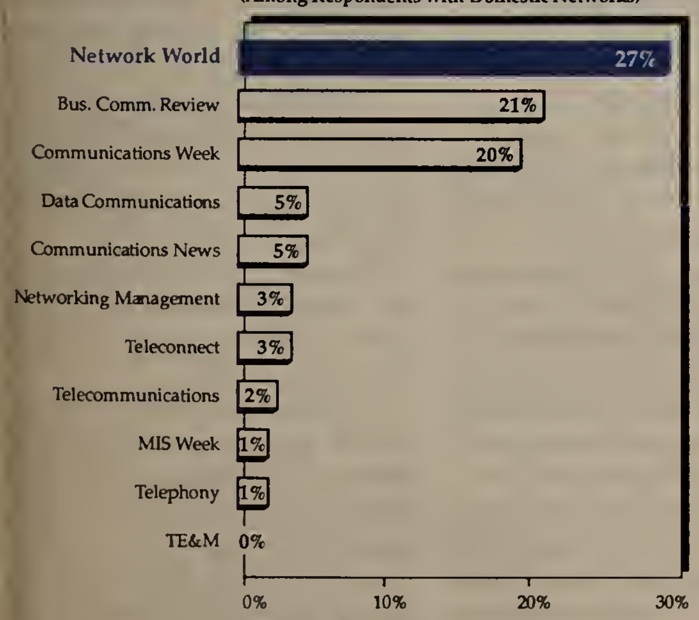
(Among Respondents with International Networks)



Base: 165 Respondents
Regular readership is at least three out of four issues.

Domestic Most Important/Useful

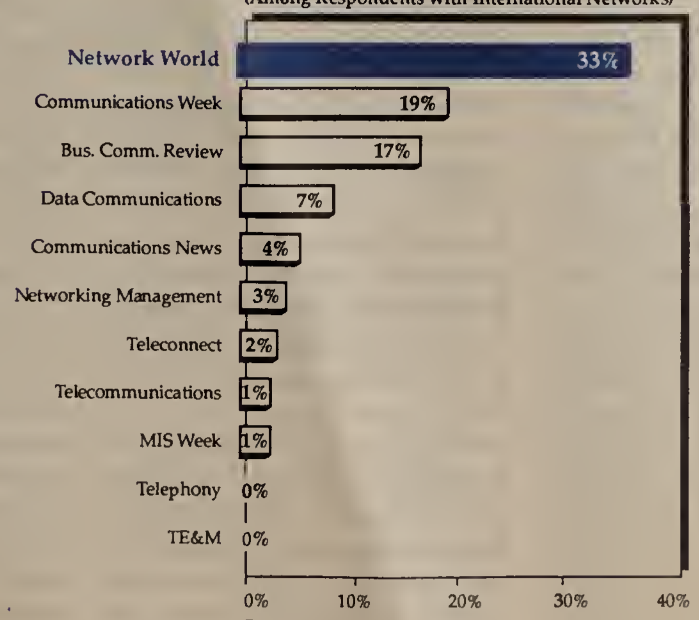
(Among Respondents with Domestic Networks)



Base: 336 Respondents

International Most Important/Useful

(Among Respondents with International Networks)



Base: 165 Respondents

Source :1990 Wall Street Journal / ICA Member Study

Kodak ports two applications

continued from page 2

In a span of just six months starting last May, Eastman Kodak set up an OS/2-based IBM Token-Ring Network at its headquarters here with 12 IBM Personal System/2 Model 80 servers running IBM's LAN Server network operating system, Holderer said.

Four of those PS/2 servers support a Microsoft Corp. SQL Server relational data base, providing remote users with access to information on product availability, prices, technical specifications, shipping dates, parts numbers and more.

The remaining servers are dedicated to handling network traffic and processing an estimated quarter million EDI transactions this year.

Resellers at remote OS/2-based workstations use Eastman Kodak-developed communications software and a modem to dial into the LAN via the GE Information Services value-added network.

Once connected to the servers, customers are presented with a menu of options, giving them access to price inquiries, order entry, order status or electronic mail. By accessing the price inquiry option, customers gain access to more than a gigabyte of product information from the local SQL Server data base.

The order entry option enables users to fill out an order worksheet, which supports an internally developed EDI format. Users then send that file over the public net to the LAN servers.

PS/2 servers on the LAN pool incoming orders and at set intervals, IBM's OS/2 Communications Manager establishes a connection to an IBM 3720 front-end processor, which in turn connects the LAN to Eastman Kodak's IBM Systems Network Architecture backbone. EDI order files are then transmitted to one of five regional distribution centers.

The Communications Manager also enables callers to establish host links to receive updates on the status of any order. The E-mail option enables Eastman Kodak to download invoices to users via EDI.

Prior to moving the EDI application down to the LAN, customers had to dial into the SNA network and establish IBM 3270 terminal-emulation sessions with the hosts in order to place orders or retrieve product data.

Under the old setup, customers had to log on and log off again for each piece of information they wanted. If, for example, a customer needed pricing information and wanted to place an order, this required two logon procedures to two different hosts with different user interfaces.

Barbara Balzano, lead systems analyst at Eastman Kodak, said 3270 emulation "leaves a lot to be desired in terms of user-friendliness."

To solve the problem, Balzano said, the division "took the order entry and pricing applications and moved them from the mainframe to a LAN. We put all that information onto SQL [Server] tables and built a [personal computer] front end for customers.

"This not only gives customers better response time, but it's much more user-friendly," she said.

Brad Blank, a consultant with Computer Task Group, based in Buffalo, N.Y., which helped develop the system, said one reason response times have improved is that SQL Server is designed to take advantage of the multiprocessing and multithreading features of OS/2. "It's as fast as a mainframe," Blank said. "SQL Server has handled our big data tables — some of which are a half million records in size — very well. And we can update data across all the servers at the same time."

Eastman Kodak can also expand LAN capacity simply by adding another server, which will support an additional 32 user logons to the network. This would be less costly than upgrading a mainframe, Balzano said.

Balzano also noted that basic network usage has increased by about 20%. Before the changeover, she said, "there was a general feeling that usage of the system was not as high as it could have been."

Given the success of the downsizing effort, Holderer said Eastman Kodak is committed to developing other LAN-based applications to respond more quickly to changing market conditions.

"In a LAN environment, you can move faster to develop applications for our business units," Holderer said.

AT&T service may be boon

continued from page 1

sure off AT&T's SDN operations," said Barney Lykens, president of the SDN Users Association, which has 297 member companies. "I fully expect this will enable AT&T to provision service faster and should also help with billing." Lykens is telecommunications manager for a large transportation company in the Midwest.

AT&T underestimated how many users would subscribe to SDN when it built its billing system, said Gilbert Piddington, vice-president of worldwide telecommunications at Unisys Corp., a large SDN user.

"The end result is that SDN billing centers and programming teams are incredibly overtaxed," Piddington said. This leads to late and inaccurate SDN bills. "But AT&T is working hard to get things cleaned up."

Most of the problems arose when requests to add new sites to SDN skyrocketed by 675% after AT&T rolled out switched access to SDN, said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy.

"SDN was not designed for tens of thousands of small switched access sites," Briere said. "That's what bogged down [service] provisioning, bogged down billing and bogged down customer service. It generally created havoc. AT&T has been trying to sour the milk for resellers ever since."

Rate structure

AT&T will offer DNS to resellers under monthly or long-term contracts. Resellers signing monthly contracts have to pay a $50,000 service establishment fee and $10 for every site added to the network to get a flat-rate discount of 22% below basic long-distance rates.

Resellers agreeing to generate a minimum of $20,000 a month in calling volume are eligible for three- or four-year contracts that provide the basic 22% discount plus additional discounts that can bring total savings as high as 43%, based on calling volume generated.

During the first year of DNS operation, the service establishment fee is reduced on a sliding scale from $40,000 for long-term customers generating $20,000 a month in call volume to nothing for those generating $100,000 a month.

The $10 per site fee is waived for the first six months as long as installation is requested within 30 days of the initial order.

DNS will allow resellers to add an unlimited number of new sites to their networks each month, compared to the current SDN restriction limiting the number of sites that can be added to an SDN network to 400 per month.

Despite these benefits, some resellers said SDN is still more attractive for resale. Chris Moore, president of Concord Network Services, a reseller in Bartlett, Ill., said SDN provides a 5% greater discount on average than DNS. Even the basic SDN rate is lower: 18.9 cents per minute compared to 19.5 cents per minute with DNS.

AT&T acknowledged that is a possibility. "There are some resellers who will determine that the provisioning intervals on SDN plus the monthly location limitations will meet their needs and they may decide to stay on SDN," said Lance Zingale, division manager for the DNS product.

Senior Editor Bob Wallace contributed to this story.

SQL Server wares debut

REDMOND, Wash. — Microsoft Corp. last week announced enhancements to its SQL Server relational data base management system that enables users to access a wide variety of IBM host-based data bases and makes it easier to develop DBMS applications that run on local-area networks.

Microsoft teamed with Micro Decisionware of Boulder, Colo., to roll out Version 1.1 of Database Gateway, software that links SQL Server users to IBM data base systems.

Under Version 1.1 of the software, users can now access data files in IBM CICS environments, including IMS/DB, VSAM, DB2 and others. Previously, the gateway only supported access to DB2 files.

Available now, the Database Gateway pricing ranges from $2,295 for a five-user version to $3,495 for an unlimited license.

On the development side, Microsoft released its Microsoft SQL Server Gateway Development Kit (GDK) Version 1.0, a development tool kit that enables application developers to build custom data base gateways to link SQL Server users to remote sources.

The heart of the tool kit is its GDK Library, which provides prebuilt routines to build into applications such as establishing client links to servers, managing memory during communications and transmitting data across a net to a client workstation.

The GDK Library works in conjunction with Sybase, Inc.'s standard DB-Library application program interface.

Microsoft SQL Server Gateway Development Kit Version 1.0 costs $2,995 and is available now.

Microsoft also announced Embedded SQL for COBOL, a tool set that will let developers embed SQL statements directly into COBOL source code.

Embedded SQL for COBOL is available now and costs $395 per developer.

— *Caryn Gillooly*

Codex boosts 6500 Series

continued from page 17

If one or more processors fail, the remaining CPUs take over without interruption.

The 6525 has eight slots, which can be used to support the CPU cards, an asynchronous I/O card, a high-speed I/O card or a new Network Storage Option (NSO) card.

The NSO card adds as much as 5M bytes of random-access memory to the switch.

The additional RAM can be used to maintain high throughput for applications such as file transfers that may use large packet sizes. It can also be used to store large tables of network user identification numbers, Burrows said.

Codex also added a new Dynamic Data Forwarding feature that gives users the ability to set the timing by which packets should be sent. That reduces delay by eliminating the possibility that packets are held up because they are not yet filled with data. According to Burrows, users can set the parameters for that feature to match the requirements of each application.

Release 2.1 software is available now. Pricing for the 6525 packet switch starts at $4,345, and the PAD pricing starts at $1,750.

Firm upgrades mgmt. tool

continued from page 19

segments — those within a bridge/router domain. If, for example, the network had several Ethernets strung together with several servers but not attached to a bridge or router, one Argus/n package could manage all the workstations on that network. Most, if not all, other products would require as many packages as there are servers.

This also gives the advantage of letting the administrator centrally manage all workstations regardless of the servers to which they are attached. Trent explained that a terminate and stay resident (TSR) program, which uses between 4K and 6K bytes of RAM, resides in each workstation. These TSRs report back hardware and software configurations to the central management software.

Currently, Argus/n uses Novell, Inc.'s Internetwork Packet Exchange (IPX) for communications; therefore, it works mainly with Novell NetWare LANs.

However, the company is in the process of deciding which other environments to support, Trent said.

The Argus/n product is available in two versions. The basic Version 1.3, which can monitor as many as 250 workstations on a single LAN segment, costs $245. A larger version, called Argus/n Internetwork, lets administrators collect information from a maximum of five internetworked NetWare LAN segments with as many as 350 workstations per segment; it costs $645. Both are available now.

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And the winners are . . .

While Hollywood honors its own at the Oscars ceremony tonight, *Network World* offers a few tongue-in-cheek awards for some of the highlights and lowlights of the last five years.

▪ **The Contract-That-Would-Not-Die Award.** The Federal Telecommunications System (FTS) 2000 contract, which was awarded after months of controversy to AT&T and US Sprint Communications Co. in a 60-40 split, has been in the news since its inception. These days, AT&T and US Sprint are sparring over FTS 2000 business and MCI Communications Corp. is claiming agencies are being overcharged for service.

▪ **The Golden Backhoe Award.** To Illinois Bell Telephone Co. for its infamous Hinsdale central office outage; to AT&T for the Jan. 15, 1990, software glitch that knocked out much of its network; and to Consolidated Edison Co. of New York for the fire that left Manhattan users without network service for as long as six days. Pepto Bismol for the users.

▪ **The Lone Ranger Award.** This goes to U.S. District Court Judge Harold Greene, who stands alone at the center of the controversy over the Modified Final Judgment. Greene doesn't even have a Tonto to help keep detractors at bay.

▪ **The Left at the Altar Award.** To Lotus Development Corp. and Novell, Inc., the biggest nonmerger news since 3Com Corp. and Convergent parted at the eleventh hour.

▪ **The What-Goes-Around, Comes-Around Award.** To the many legislative efforts to free the Bells from Modified Final Judgment restraints — all of which sank into the black hole of Congress. Is this the year Congress finally acts?

▪ **The Darth Vader Award.** To Olof Soderblom, who loomed over the token-ring network market like the presence in black from the *Star Wars* trilogy. Was Madge Networks, Ltd. founder Robert Madge playing Luke Skywalker?

▪ **The Fastest Burnout Award.** Shared tenant services (STS), in which companies in the same building would share equipment such as private branch exchanges, sounded like a great idea. But regulatory actions by state public utility commissions and the Federal Communications Commission, which refused to allow partitioning, dealt STS a blow from which it never recovered.

▪ **The Technology-Whose-Time-Hasn't-Come-Yet Award.** Mention voice/data integration, and you'll hear: "I'm waiting for ISDN." But how long should users have to wait? A 1986 AT&T ad read: "ISDN to some is a distant vision of the possible future of telecommunications. To AT&T, ISDN is a reality." But ISDN still isn't a reality for many users.

▪ **The "What Happened to Our Market" Award.** To the minicomputer makers who were hit hard by the emergence of personal computer local-area networks. At last year's DECWorld, Digital Equipment Corp. founder Ken Olsen jokingly said DEC no longer sold minicomputers; it sold servers. This announcement came only nine years or so after the first "year of the LAN."

— Alison Conliffe, Joanne Cummings and Salvatore Salamone

A half decade of growth, controversy and confusion

What happened to the issues, technologies and pundits that shared the spotlight five years ago?

By Bob Brown and Barton Crockett
Network World Staff

The network industry has undergone major changes since *Network World's* first issue on March 24, 1986.

A brief walk through *Network World's* past reveals an industry fraught with controversy, misguided predictions and technical revolutions that pushed enterprise networking in directions no one could have predicted.

Beginning with the office and campus environments, one of the bigger controversies that gripped the industry five years ago concerned the positioning of private branch exchanges as intrabuilding voice/data hubs that could meet users' emerging local data communications needs.

"Digital switches were sold as platforms for many applications, including data switching," said Patrick Springer, director of communications industry services for Telecommunications Management Consultants in Needham Heights, Mass.

In retrospect, it's clear that most users didn't buy the voice/data PBX concept, opting instead for local-area networks.

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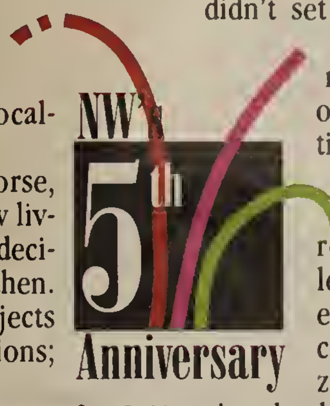
Leading-edge users of the past revisited

By Jim Brown and Paul Desmond
Network World Staff

Five years ago this week, *Network World* started chronicling pioneering uses of emerging net technologies such as very small aperture terminals and broadband local-area nets.

For better or worse, those users are now living with the net decisions made back then. Some of the projects have met expectations; others have fizzled.



Consider the fate of VSAT projects announced in 1986 by K mart Corp. and Financial Information Trust (FIT), a bank data processing service bureau. K mart recently declared its venture a success, while FIT's did not meet expectations.

At the time, K mart's plans to tie 2,200 stores via VSATs to a data center in Troy, Mich., was seen as a bold initiative. "We didn't set out to be pioneers," said Walt Bzdok, K-mart's senior director of satellite communications and systems reliability. "But we were." The network replaced dial-up and leased lines and made it easier for K mart to process credit card authorizations on-line, a decision that has reduced losses from stolen credit cards.

K mart also uses the VSAT net for applications it had not originally envisioned, such as broad-

(continued on page 50)

In the news: 1986

What was the hot news in 1986? Take a look at some of the headlines from *Network World's* first year.

Users force LU 6.2 issue
Companies wield buying power to hasten vendor adoption of SNA tool.

Large corporations have begun to wield their purchasing power to pressure vendors into supplying IBM LU 6.2-compatible products in an effort to simplify the job of networking disparate types of computers. — *March 24*

First MAP net to bow

DETROIT — Gould, Inc.'s Industrial Automation Systems division will announce tomorrow the first industrial local-area network that conforms with the Manufacturing Automation Protocol's Enhanced Performance Architecture. — *April 7.*

Big Blue drops bombshell
Token-Ring links to mainframe debut.

RYE BROOK, N.Y. — IBM closed the gap last week between its microcomputers and larger systems with the introduction of Token-Ring Network links to mainframes and the System/36. — *April 21*

Supreme Court curbs FCC rule over PUCs
Lower rates, longer write-offs may result from states' rights victory in court's depreciation declaration.

WASHINGTON, D.C. — The U.S. Supreme Court ruled last week that the Federal Communications Commission cannot dictate telephone equipment depreciation methods or rate-making policies to state public utility commissions. — *June 2*

T-1 mux unveiled
New firm packetizes voice, data.

NEW YORK — The first voice and data T-1 multiplexer based on packet-switching technology was unveiled here last week by StrataCom, Inc., a Cupertino, Calif., start-up founded by former top officials of Rolm Corp. — *July 14.*

DEC ushers IBM PC into its net world
Product troika puts Big Blue on DECnet.

MERRIMACK, N.H. — More than five years after IBM introduced its Personal Computer, Digital Equipment Corp. last week acquiesced to IBM's industry stranglehold by introducing three technically elegant products that tie Personal Computers into DEC networks. — *Sept. 8*

MCI breaks 800 barrier
Hits AT&T stronghold.

WASHINGTON, D.C. — MCI Communications Corp. set to work dismantling AT&T's monopoly in the multibillion-dollar 800 service market last week with the introduction of MCI 800 Service, a competitive toll-free offering scheduled for availability early next year. — *Sept. 15* ◘

A half decade of growth

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"When users discovered LANs, they blew PBXs out of the water," said John Parker, manager of technical sales and support at Fujitsu Business Communication Systems, a PBX maker in Anaheim, Calif.

Everett Stonebreaker, supervisor of telecommunications at Florida Power & Light Co. in Miami, added, "We considered using PBXs for voice and data about five years ago. But it turned out that separate data and voice nets were simpler and cheaper."

King Ethernet

In 1986, even the LAN market was still in its infancy. Ethernet and Arcnet ruled, and IBM's Token-Ring Network had just hit the market. Some of the bigger vendors were Corvus Systems, Inc. and Sytek, Inc. Novell, Inc. and Banyan Systems, Inc. were virtually unknown.

Since then, LANs have entered the mainstream. The percentage of workstations linked to LANs has grown from 6.19% in 1986 to 33.2% in 1990, according to Framingham, Mass., market researcher International Data Corp (see graphic, page 1).

"The major difference between LANs then and now is that now people trust them to support their mission-critical applications, whereas five years ago, they didn't," said Norman Block, president and founder of Evernet Systems, Inc., a Los Angeles-based LAN systems integrator.

While LANs were conquering the desktop, users were struggling to conquer their vendors by joining groups such as the North American MAP/TOP Users Group, which was formed to push for open systems.

"The early user groups had to fight tooth and nail to get vendors' attention," said Bud Huber, a senior consultant at Hughes Aircraft Co. in Westchester, Calif. "Judging from the changes we've seen among vendors that have moved to support open systems or other user needs, the user groups have been a success."

Along with measures to improve multivendor connectivity within their buildings, users have worked during the past five years to boost their wide-area nets.

One of the most important developments on that count has been the soaring popularity of T-1 networks. While T-1 technology was available earlier, it took off in 1986, offering users a cost-effective means to build high-capacity voice/data backbones.

"The initial T-1 users had received numerous arrows in their back, due to problems in transmission facilities and multiplexer sensitivities," said Phil Evans, director of telecommunications at FMC Corp. in Dallas and president of the International Communications Association (ICA).

But Evans, an early user who deployed his first T-1 net in 1985, said improvements in transmission facilities and multiplexers during the past half-decade have vastly increased user confidence in the technology.

In particular, Evans argued that deployment of fiber-optic facilities not only revolutionized T-1 networking, but all private and public networking, by reducing line noise and leading to reduced transmission costs.

For example, a coast-to-coast T-1 link that cost $56,000 per month in 1986 dropped to $19,000 per month in 1991, according to Vertical Systems Group, a network consultancy in Dedham, Mass.

Competition affects rates

Price declines such as that have been driven by heightened competition in the long-haul market, competition that began in earnest when GTE Corp. and United Telecommunications, Inc. merged to form US Sprint Communications Co. in 1986.

Brian Moir, legal counsel for ICA, credits the vigorous nature of competition since 1986 with vastly improved carrier service, product offerings and prices.

Yet not every technology trumpeted in 1986 has a foothold in enterprise nets.

For example, in 1986, *Network World's* pages were filled with stories of Integrated Services Digital Network trials and opinion pieces arguing that ISDN would change networking. But at end of last year, less than 5% of the regional Bell holding companies' central offices and less than 1% of their access lines supported the technology.

Firms empower managers

continued from page 2

terms management can understand.

"To a large degree, technical people have been unable to communicate effectively to senior management on business matters," said Patrick O'Haren, head of MIS at National Semiconductor Corp. in Santa Clara, Calif.

Thus, senior executives may feel more comfortable employing a CIO with a different background, perhaps someone from human resources or finance with sound business skills, O'Haren said.

Some top executives have appointed generalists to head IS because they recognize the need to manage IS as a business rather than a back-room operation. Many believe that a business person is better able to wield information technology for competitive advantage or reign in ballooning IS costs.

For example, Stuart Smith, CIO of ICI Chemicals & Polymers, Ltd. in the U.K., said he was appointed by the firm's chief executive officer to check the 20% annual rise in IS expenditures and help business units achieve greater benefits from IS investments. Smith, who previously was head of research and development at the firm, knew little about IS before taking the position; he was recruited because of successes in managing business operations.

Dangers abound

Despite the advantages, there are attendant risks in appointing a generalist to the top technology spot, observers say.

"Without solid technical leadership, systems development and operations within a company will deteriorate. This will cause many of the best IS people to resign and make the company ripe for outsourcing," said Tom Pettibone, senior vice-president of IS at New York Life Insurance Co.

O'Haren said IS professionals see the appointment of a nontechnical CIO as a professional setback. In their view, a nontechnical CIO will not understand what they do or be able or willing to persuade management to give them the resources they need to help the business.

Bud Mathaisel, director of Ernst & Young's Center for Information Technology and Strategy in Boston and former CIO of The Walt Disney Co., said his technical background helped him avoid IS projects at Disney that were dead ends or not in the company's best interests.

"If you are completely nontechnical, it's easy to get talked into something. All you need is a couple of failures and you're gone," Mathaisel said.

To minimize the risks of having a nontechnical CIO, many companies are opting to appoint a generalist CIO along with a senior IS manager who serves as the CIO's right-hand man, according to Roger O'Connor, senior consultant at Edward Perlin Associates, Inc., a management consulting firm in New York.

Merrill Lynch, for example, recently announced that it would replace retiring CIO DuWayne Peterson with Edward Goldberg, a business-side executive who has never been a technology manager. For technical advice, Goldberg will rely heavily on Howard Sorgen, director of global information services.

George Tabback, director of corporate information systems at Ingersoll-Rand Co. in Woodcliff, N.J., said several divisions within his company have appointed nontechnical managers to head up IS. These executives work with senior IS people who provide the needed technical support.

Leading-edge users of the past

continued from page 49

cast training and internal news programs. The net, the majority of which is in place, came in under budget.

However, things did not go as well for FIT. In 1986, the company signed a five-year, $12 million VSAT contract with Equatorial Communications Co. — now owned by Contel ASC — to link a total of 800 sites to its data center in Des Moines, Iowa.

One of the problems FIT encountered was the promised five-second response time for IBM 3270-based applications was sometimes exceeded by 20 to 30 seconds. Because that happened only periodically, average response time was kept within the five-second limit, thus preventing FIT from penalizing the vendor.

The VSAT network was originally expected to trim FIT's $5.16 million 1986 communications budget to $3.48 million by eliminating long-haul leased-line charges. But the plan backfired.

"The cost of AT&T [leased-line] services fluctuated like we said they would," said John Hansen, senior director of technical support at FIT. "The only thing is they went down instead of up."

Last year, FIT signed an AT&T Tariff 12 contract and moved the 3270 terminal traffic onto a terrestrial network. Once the VSAT contract expires in 1992, FIT will be looking at other options for its ATMs and teller terminals.

Saving with microwave

Miscalculating the rate at which private-line and Centrex tariffs would increase also forced San Diego County to reevaluate the savings it had forecasted for a big project launched in 1986.

The county signed a contract with Contel Business Networks that was projected to save $40 million over 10 years ("San Diego crafts a cost-paring net," *NW,* Nov. 10, 1986). That projection has been pared down to $31 million.

"The savings of $40 million were based on a projection of an 8% per-year overall tariff increase," said Vicki Pion, the county's deputy director of the department of information services. "And we're looking at about 2%."

She said the less-than-expected increases resulted from the competitive threat of private networks.

"If people hadn't made the decision to go to private networks, I don't believe the operating companies would have reduced their tariffs," Pion said.

San Diego's network is providing many of its projected benefits, including a videoconferencing system for criminal arraignments that saved $200,000 in travel costs during one year, and it promises bigger savings as more jails and courtrooms are brought on-line.

One of the bigger LAN projects launched in 1986 was the U.S. Air Force Academy's installation of Falcon Net, a $7 million, 10,000-node broadband LAN designed to support data and video applications for students and faculty at the academy's Colorado Springs campus ("Mammoth local net to support USAF cadets," *NW,* Nov. 10, 1986).

"What we achieved is very close to what our initial objectives were," said Col. William Ayen, associate dean for resources at the academy. "As of August 1990, we had a PC on every cadet's desk connected to the network."

Cadets use the network to communicate among themselves, to submit work for classes and to receive as many as 36 video channels in their dorm rooms. Video applications include everything from live classroom instruction to a CNN feed, Ayen said.

The broadband network turned out to be a good choice.

For example, it had enough spare bandwidth for the academy to install a campuswide Ethernet to support users of engineering and scientific workstations as well as interactive videodisc stations, which are used for courses such as foreign languages.

NETWORK WORLD

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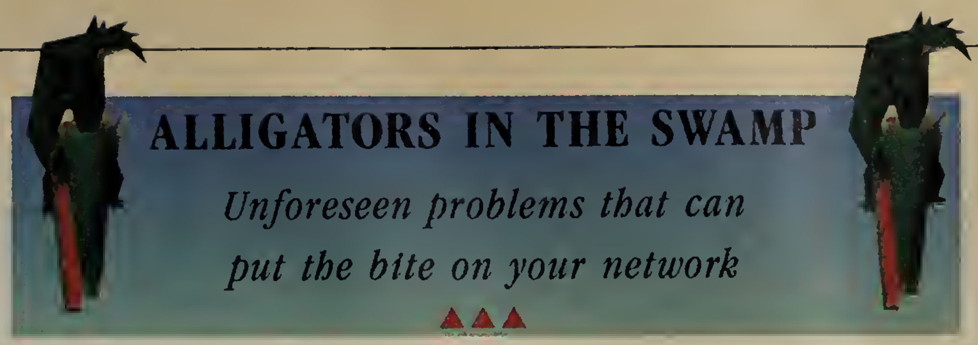

ALLIGATORS IN THE SWAMP

Unforeseen problems that can put the bite on your network

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When protocol flavors don't mix

Internetworking with different protocol versions can land you in the soup.

When different elements of your network use different flavors of a protocol, you may find you have a recipe for disaster.

I found this out when my company, Ashton-Tate Corp., purchased three Hewlett-Packard Co. HP 3000 minicomputers in November 1990 to install in our offices in Dublin, Ireland, Singapore and Torrance, Calif. We chose the HP 3000 because we felt it would be the best platform for supporting the corporate general ledger, sales consolidation, and ordering and manufacturing applications we planned to run. These applications would be accessed by our remote users in various countries.

Ashton-Tate's worldwide local- and wide-area networks, which support more than 1,500 users, are built largely on Banyan Systems, Inc.'s VINES. This Banyan network would need to be integrated with, but not necessarily provide the total networking solution for, the project.

Our Banyan servers could route Transmission Control Protocol/Internet Protocol traffic, a capability on which we hoped to capitalize. HP told us the HP 3000, running the MPE/XL operating system, supports TCP/IP for network communications. However, HP cautioned us that its system uses a different protocol for mapping software addresses to hardware Ethernet or token-ring addresses than the Address Resolution Protocol (ARP), which is more commonly found in Unix TCP/IP environments.

Specifically, HP uses a home brew protocol called Probe for address resolution. Our Banyan servers configured with TCP/IP routing handle ARP correctly but do not recognize the Probe protocol. Therefore, we couldn't use Banyan servers; we needed a solution that could route both Banyan and HP traffic over our X.25, 56K and 64K bit/sec leased circuits.

I knew that Menlo Park, Calif.-based Cisco Systems, Inc. makes multiprotocol routers, so I called them and asked if they supported HP's Probe protocol on TCP/IP as well as on VINES. I was told that all their routers supported both ARP and Probe — and the December release of Version 8.2 of their operating system would also support VINES.

We then had a series of technical meetings with both Cisco and HP. Both companies explained that Cisco's routers were used quite extensively in HP's own corporate network, which I found reassuring. So I requested that we purchase the necessary hardware and software. It was just before Christmas; our management had made a commitment to provide some offices with access to the system by the end of January 1991.

Our network configuration called for the Banyan and HP traffic to be routed between the offices in the various countries and central host locations via the Cisco router's 56K, 64K bit/sec and GE Information Services X.25 network circuit interfaces. First, a local implementation was configured in the Torrance office to allow the programmers there to access the headquarters HP 3000 on the same physical LAN. This process involved installing NS 3000/XL Network Services software on the HP 3000 and personal computers.

When I examined this setup with a protocol analyzer, I observed that when the personal computers made their initial connection, they didn't use the IP address of the requested HP 3000. The personal computer first issued a Probe-Name multicast message containing only the HP 3000's host name. The HP 3000 responded with its own IP and Ethernet addresses. What puzzled me was why the personal computer used the host name and not the IP address to make the initial connection. Then I learned about the different flavors of Probe.

When configuring HP's personal computer networking software, NS Services 2.0, you are allowed to enter only two IP addresses: one for the personal computer and one for the default gateway, which routes traffic beyond the LAN. The software assumes the default gateway is an HP host that understands Probe but is not necessarily the HP host to which you ultimately want to connect. HP hosts can act as routers or gateways to other nets supporting HP's protocols.

Under Probe, a personal computer must request a connection to a host by its host name — Probe-Name — rather than the IP address. However, Cisco routers only understand a second flavor of Probe, called Probe-Virtual Network Address (VNA). Probe-VNA, which translates an IP address into a data-link address, is what HP hosts typically use to communicate with one another. Was there a way for the personal computers to use Probe-VNA too?

Under NS Services 2.0, if a personal computer is unable to get a connection to a host using Probe-Name, it tries again using Probe-Proxy, a third flavor of Probe. HP hosts, acting as Probe-Proxy servers on a common LAN, respond to this Probe-Proxy request for host name-to-IP address mappings with the target HP 3000's IP address. The requesting personal computer then uses this information to issue a Probe-VNA, which a Cisco router or HP 3000 configured as a gateway can use to route the terminal traffic to the target host.

HP suggested two possible solutions to our dilemma: to put a Probe-Proxy server at all of our remote sites or to use bridges. The former option would require us to install overpowered, underutilized HP 3000s simply so we could route HP traffic. This would defeat the purpose of having centralized hosts.

Remote bridging also was not a viable option. Traffic volumes would be quite bursty and WAN connections would be via relatively slow 64K bit/sec leased circuits and 9.6K bit/sec X.25 circuits. To use our circuits most efficiently, we would have to rely on the Cisco routers' higher layer protocol support.

With the January deadline fast approaching, I frantically continued to search for a solution. Then Roy Bittenger, an HP customer systems engineer, called to tell me that he had found a patch program for NS Services 2.0 that might solve our problem. Essentially, the patch would allow us to configure all personal computers with the IP addresses of all HP hosts on the network. Then the personal computers could issue Probe-VNA requests, which the Cisco routers could understand, instead of Probe-Name. Roy sent me a copy of the patch with one caution: "I've never used it, and it is not a supported HP product."

"What's to lose?" I thought. As a test, I set up a personal computer two Cisco router hops away from the HP host in Torrance. A Cisco router was identified by IP address on the personal computer's software as the required default gateway with the personal computer's NS Services standard configuration utility. The router was also identified by IP address in the HP 3000's NS directory as a legitimate host with which the router could "talk." I then installed the patch on the personal computer. The patch created a text file in a new subdirectory containing all HP host names and their associated IP addresses. When I typed "CONNECT HPTORR," the PROBE.EXE program looked up the target host's IP address in the text file and sent a Probe-VNA request. The Cisco router responded by routing terminal traffic to the target host. Eureka!

HP will be integrating the Probe patch into NS Services 2.1, which is scheduled to be released in May or June. Until then, the patch is available from HP upon request at no charge.

The spectrum of internetworking options contains some unusual — and unexpected — ingredients. Even if you think you have a foolproof recipe for networking success, you may find trouble brewing. ☒

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IT'S HARD TO DRAIN THE SWAMP when those reptiles keep getting in the way. To share your "alligator story," call Susan Collins, assistant features editor, at (508) 820-7413 or fax your idea to (508) 820-3467.

by Dan DesRosiers

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